

A MONOGRAPH OF *MERODON* (DIPTERA: SYRPHIDAE). PART 1

Hurkmans, W., 1993 A monograph of *Merodon* (Diptera: Syrphidae). Part 1. – Tijdschrift voor Entomologie 136: 147–234, figs. 1–106. [ISSN 0040-7496]. Published 10 December 1993. This first part of a revision of the genus *Merodon* deals with 61 species characterized by two synapomorphies, viz. arcuate abdominal pruinose bands and abdomina with tapering second tergite. Eleven monophyletic species groups are recognized, accounting for 51 species. Seven species are placed in an undefined set while three species are discussed separately. Descriptions of the species groups are provided. All species are described and their important characters figured. Of the 91 nominal taxa mentioned in the checklist, 61 are species, 2 subspecies, 6 varieties and 22 synonyms, 4 of which are new. Of these, the following 28 species and one subspecies are new to science: *M. mariae*, *M. ottomanus*, *M. testaceoides*, *M. altinosus*, *M. hypochrysos*, *M. marginicornis*, *M. sophron*, *M. ankylogaster*, *M. auronitens*, *M. oidipous*, *M. persicus*, *M. tangerensis*, *M. xanthipous*, *M. aberrans isperensis* subsp. n., *M. cupreus*, *M. lusitanicus*, *M. splendens*, *M. warnckei*, *M. kaloceros*, *M. vanderghooti*, *M. bequaerti*, *M. elegans*, *M. lucasi*, *M. nitidifrons*, *M. satdagensis*, *M. schabchi*, *M. taniniensis*, *M. toscanus*, *M. aureotibia*.

Lectotypes are designated for 23 nominal taxa; three new combinations are introduced. An annotated list of species excluded from *Merodon* is given. *Azpeytia shirakii* nom. n. is proposed for *Merodon scutellaris* Shiraki.

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Key words. – Diptera; Syrphidae; *Merodon*; new subdivision; new species; lectotypes; excluded species; nomen novum.

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INTRODUCTION

The genus *Merodon* is a moderately large group of syrphid flies naturally occurring in the palaearctic and ethiopian faunal regions. As far as known the development of the larvae takes place in bulbs or rhizomes of Liliaceae and Amaryllidaceae. The last comprehensive discussion of the genus, by Sack (1931), is outdated, contains several errors, and deals with only about half the species currently known. The descriptions and discussions of *Merodon* species published so far largely disregard important male genital characters considered suitable for grouping purposes and species recognition.

This paper deals with eleven monophyletic species groups defined by apomorphies and a remaining undefined set of species. All species discussed in this paper are grouped by two synapomorphies, viz. arcuate pruinose bands on the abdominal tergites, and an abdomen with tapering second tergite. Only the males are used for grouping purposes, since their genitalia yield enough data for subdivision. The female genitalia are rather uniform; moreover the ornamentation of the legs and specialized pubescence areas are

usually much less developed in the females than in the males.

MATERIAL

Material was studied from the following institutes and private collections (with acronyms used in this paper): BMNH, British Museum (Natural History), London, England; MNHN, Muséum National d'Histoire Naturelle, Paris, France; LSF, Museo Zoologico della Specola, Florence, Italy; MCSN, Museo Civico della Storia Naturale, Milan, Italy; BSA, Benediktinerstift Admont, Admont, Austria; NHMW, Naturhistorisches Museum Wien, Vienna, Austria; ZMHB, Museum für Naturkunde, Von Humboldt Universität, Berlin, Germany; DEIC, Institut für Pflanzenschutzforschung, Eberswalde, Germany; HLMD, Hessisches Landesmuseum, Darmstadt, Germany; MFNS, Museum für Naturkunde, Stuttgart, Germany; LAU, Musée Zoologique, Lausanne, Switzerland; KBIN, Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels, Belgium; MRAC, Museum voor Midden Afrika, Tervuren, Belgium; ZMUC, Zoological Museum, Copenhagen University, Copenhagen, Denmark; SAL, Zoological Institute of Salamanca University, Salamanca, Spain; IEE, Instituto Espanol de Entomologia, Madrid, Spain; ZMAS, Zoological Institute of the Russian Academy of Sciences, St. Petersburg, formerly Leningrad, Russia; TMA, Természettudományi Museum Allátara, Budapest, Hungary; BTM, Bakonyi Természettudományi Museum, Zirc, Hungary; LHW, Entomological Institute, Agriculture University, Wageningen, the Netherlands; RMNH, Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands; JLR, J. A. W. Lucas, Rotterdam, the Netherlands (the most important single source of material; material from several other, mainly private collections was made available by Mr Lucas as well); ZMAN, Institute of Taxonomic Zoology, Zoological Museum, University of Amsterdam, Amsterdam, the Netherlands; PC, S. J. Paramonov collection. Many types of species described by Paramonov were formerly preserved in his private collection. After Liepa (1969) this collection is considered to have been lost.

METHODS

Preparation of specimens

In order to study the male genitalia, specimens prior to examination were relaxed using dilute ethanol vapour at room temperature for 6 to 48 hours depending on specimen size. After relaxation the genitalia were extracted with an insect pin with hooked tip. Isolation of the genitalia often proved necessary; in such cases the genitalia were stored in microvials con-

taining a 60%–40% mix of glycerol and ethanol. The genitalia were examined in the dry state since boiling or prolonged submersion in KOH led to maceration and damage to the pubescence. The pubescence found in many species could hardly be seen properly in wet state. We were confronted with the same problem with genitalia already isolated and stored in Canada balsam. Genitalia already stored in microvials (in ethanol/glycerol mixture) were repeatedly washed with 70% ethanol and left to dry prior to examination.

In *Merodon*, the female genitalia have been of little use for taxonomic purposes since they are hardly sclerotized. If dried they shrivel completely, and if stored in a liquid medium the various pubescences are difficult to distinguish.

Methods used in grouping

The species have been grouped on the basis of apomorphic characters. Characters were considered apomorphic after a preliminary survey of the corresponding characters in other species groups and in the genus *Eumerus*, the presumed sister group of *Merodon*, on the ground of similarities in the genitalia and the banding pattern on the abdomen of some species of *Eumerus* formerly placed in the genera *Megatrigen* Johnson and *Amphoterus* Bezzi (see also Hull 1949: 395). On the basis of this comparison a slightly oblique to parallel, straight banding pattern, comparatively simple male genitalia and a comparatively stout abdomen are therefore considered to be plesiomorphic.

Terminology

The terms used to describe the various structures are illustrated in figs. 1–4 (head), 5 (thorax), 6 (wing), 7 (leg) and 8–17 (male genitalia). The terms are mainly derived from McAlpine (1981), but some terms from Speight (1987), Van der Goot (1981), Hull (1949), Sack (1931) and Metcalf (1921) have been used for elements occurring specifically in Syrphidae. A few terms are introduced here to describe structures in the male genitalia; they are illustrated in figs. 8–17. The vertex angle and ocellar angle, as used here in describing the head, are illustrated in fig. 3.

The ratio obtained by dividing the compound eye touchline length by the vertex height, measured from its angle to the border with the occiput, is cited as the tl-v ratio. This ratio is often a useful distinguishing character. The antennal ratio, illustrated in fig. 2, is also frequently used. Sternites and tergites are counted in Roman numerals and abbreviated S and T, respectively.

Drawings and maps

All drawings are original; they were made with the

aid of various stereo microscopes with drawing tubes under 10-80× magnification; all scale lines represent 1 mm.

Distribution maps are provided for all species. On the distribution maps only those records are represented which are based on examined material or on reliable references. References from literature for species easily confused with other species have not been included. Where many records for a species occur, single records are represented by small symbols. The large symbols represent five records in the same area.

THE GENUS MERODON MEIGEN, 1803

Merodon Meigen, 1803: 274. – Type-species *Syrphus clavipes* Fabricius, 1781: 427 [designation of Westwood 1840: 137].

Lampetia Meigen, 1800: 34 [Suppressed by the I. C. Z. N., Opinion 678]. – Type-species *Syrphus clavipes* Fabricius, 1781: 427 [designation of Coquillett 1910: 557].

Exmerodon Becker, 1912: 604 (as subgenus of *Merodon*). – Type-species *Merodon (Exmerodon) fulcratus* Becker, 1912: 604 [original designation].

Taxonomic and nomenclatural history

From 1781 to c. 1900

In 1800, Meigen established the genus *Lampetia* to accommodate *Syrphus clavipes* Fabricius, 1781 (Meigen 1800). In 1803 he introduced the new name *Merodon* for this genus, mentioning that *Syrphus curvipes* [error for *clavipes*] belongs in *Merodon* (Meigen 1803). The work of Meigen (1800) has been placed on the Official Index of Rejected and Invalid Works in 1963 (I. C. Z. N. Opinion 678); since then only the Meigen (1803) names should have been used. Several species described by Fabricius and Rossi prior to the description of *Merodon* were later incorporated in this genus by e.g. Fabricius (1805).

At the start of the nineteenth century species now included in *Merodon* were described in several genera such as *Eristalis* Latreille, 1804, and *Milesia* Latreille, 1804. As, in the first half of the nineteenth century, the concept of the various syrphid genera crystallized, many new species were rightly described in *Merodon*. During this period Fabricius (1805), Meigen (1822-1838), Macquart (1834, 1842) and Rondani (1843-1868) described and redescribed many species. Several synonyms were created through interpretation of colour forms as species. Walker (1849-1860) assigned many species to this genus, all but one incorrectly. Loew (1862a-b, 1869) described several new species and also provided redescriptions for several known species. Strobl (1893-1909) described several new, and redescribed many known taxa. The authors mentioned so far almost never discussed the differences between species, except when establishing a

new taxon; they were not concerned with subdividing the genus or with discussing its position within the Syrphidae.

The twentieth century

The first author providing a comprehensive generic description for *Merodon* was Verrall (1901) who located this genus in the subfamily Eristalinae. Villeneuve (1909-1934) published several new species and recognized a number of synonyms within *Merodon*. Becker (1912) subdivided *Merodon* into two subgenera, the nominal subgenus *Merodon* and the new subgenus *Exmerodon* Becker, 1912. The latter subgenus at that time comprised only the type-species *Merodon fulcratus* Becker, 1912. Stackelberg (in Stackelberg & Richter 1968) included his new species *dichopticus* in the same subgenus, established to accommodate species with dichoptic eyes in the males. In the only monograph on *Merodon* so far, by Sack (1913a), *Merodon* was not assigned to any subfamily although it was compared with several genera in the Eristalinae. Other publications by Sack (1913-1938) contain a wealth of information on *Merodon*, many descriptions of new species and a subdivision of the genus based on external similarities. Major contributions to the knowledge of *Merodon* were made by Paramonov (1924-1937). He divided the genus into species groups, not all of which were published. These groups, like those of Sack (1913a), were based on external similarities. Moreover Paramonov critically reviewed papers by Becker (1912) and Sack (1931), rejecting some species and expressing his doubts about others.

Other contributions were made by Gil Collado (1930), Curran (1939) and, more recently, Ségué (1961), who surveyed the species known from western Europe. Van der Goot (1981) in his work on the north-west European Syrphidae provided a key for the species occurring in that area.

The works mentioned so far did not make use of genital characters to identify the species. In *Merodon* many problems existed as to the separation of species, which easily could have been solved by superficial examination of the genitalia. The first papers in which genitalia of *Merodon* are discussed and figured were by Glumac (1958) and Gaunitz (1969). Regrettably the drawings provided are insufficient, but they afford an insight into the great variety within the genus.

There is a considerable amount of literature on one single species, the narcissus bulb fly *Merodon equestris* (Fabricius, 1794), which is a pest in flower bulb cultivation. This species probably received more attention in terms of literature produced, than all other species together. This literature is mainly concerned with economical aspects, genetics and life cycle. Some of this literature is referred to under that species. No

other species of *Merodon* are of known economical importance.

Diagnostic characters

The genus *Merodon* is characterized by the following characters: (1) Radius 4+5 curves deeply into cell r5 (e.g. fig. 19 d); (2) the apical part of Media is strongly recurrent; its subapical portion is slightly sinuate (e.g. figs. 6, 19 d); (3) dm-cu is weakly, smoothly curved, not sinuate (e.g. figs. 6, 19 d); (4) femora 3 have a concave lower face and apically bear a single projection at the distal end (e.g. figs. 20 a through e).

These features are found in both sexes; the size and shape of the projection on femora 3 is rather variable, but this projection is always present although it is reduced in some species.

Species of *Merodon* have sometimes been assigned to other genera. More often, species of *Mallota* Meigen, 1822, and *Eumerus* Meigen, 1822, are wrongly assigned to *Merodon*. The genus *Azpeytia* Walker, 1865, includes species that can be mistaken for *Merodon*.

In *Azpeytia* the femora 3, which are less stout than in *Merodon*, bear two projections or series of spinules distally; the scutellum is much wider than in *Merodon*; R4+5 curves only weakly into cell r5; dm-cu is distinctly sinuate to kinked; moreover the oral margin is less projecting than in the majority of *Merodon* species (figs. 18 a, 19 b, 20 k, l).

In *Eumerus* the femora 3 have a convex lower face and bear two projections or spinule series as in *Azpeytia*; the 3rd antennal article is relatively larger and shorter in *Eumerus* than in most *Merodon* species; R4+5 does not or hardly curve into cell r5 while dm-cu is strongly kinked in *Eumerus*; in several *Eumerus* small appending veinlets of the dm-cu are found; these are not found in *Merodon* (figs. 18 c, 19 a, 20 f, g, h, j).

In *Mallota* the apical part of vein M is not recurrent as in *Merodon*; moreover *Mallota* species have a distinct facial knob, not found in *Merodon* (figs. 18 d, 19 c, 20 m, n).

Platynochaetus Wiedemann, 1830, is rather similar in appearance to *Merodon*; the males may be distinguished by their curious antennae, while both sexes show a facial knob; the position of the bands on the abdomen is different (anteriorly in *Platynochaetus*, in mid-region in *Merodon*). However, the wing venation and the shape of femora 3 are quite similar to that in *Merodon* (figs. 18 e, 19 e, 20 o, p).

The larvae of *Merodon* may be separated from those of other genera by using the key of Heiss (1938), who figured the larva of *Merodon equestris*. As the larvae of most species are still unknown, identi-

cation may be problematic. According to Maldonado Capriles & Berrios (1977) the puparium of *Merodon* can be confused with that of *Copestylum* species.

Description of the imagines (fig. 23 d)

In all respects species of *Merodon* conform to the criteria established for the Syrphidae by many authors, e.g. Verrall (1901), Lundbeck (1916), Sack (1931), Hull (1949) and Van der Goot (1981).

Habitus: Stoutly built to moderately slender, rarely very slender syrphid flies. Body length 5-25 mm, wing span 6-35 mm. Head, thorax and abdomen about equally wide. Legs rather stout, the trochanters 3 and femora 3 in many species swollen and ornamented in the males. In many species pruinose bands of microtrichiae are present on the thorax and abdomen. The thoracic surface is black or dark brown, in several species metallic lustrous; the abdomen is black to brown, often with yellow to red lateral spots which may extend over all the abdomen. Wings mostly clear although infusate wings rarely occur. A typical representative of the genus, *M. distinctus* Palma ♂ is shown in fig. 23 d. Many species mentioned in this paper are superficially similar, especially those of the *alagozicus*, *avidus*, *crassifemoris*, *nigritarsis* and *van-dergooti* groups.

Head: In the majority of species the males are holoptic while intermediate and dichoptic conditions occur in males of several species; females always dichoptic. Compound eyes dark brown to reddish, usually bearing moderately dense whitish pubescence. Antennae shorter than head except in a few species with lengthened third article; third article usually longest and widest, often conspicuous; arista inserted rather basally on dorsal margin. Coloration of antennae most variable. Face lacking knob; oral margin clear, often conspicuous, seldom weak; genae absent; facial surface little sculptured, dark, often metallic lustrous, often yellow to white pruinose and pubescent. Frons concolorous, often denser pubescent than face; in females lateral strips on frons often pruinose, leaving free a lustrous midstripe; species with an all lustrous or all pruinose frons occur. The pruinose frontal strips do not occur in dichoptic males. In males with incompletely touching eyes the narrow frontal strip is bald. Holoptic males show considerable variety in length of the touchline of the eyes. The vertex is dark, in some species metallic lustrous, and often conspicuously dark pubescent in the ocellar region. Occiput dark, pubescence concolorous, often white to yellow pruinose down sides (figs. 3-4, 18 b).

Thorax: Slightly elongate, humeral calli well marked, dorsal suture clear laterally only; colour dark, often metallic lustrous on dorsum, scutellum, kate-

pisternum, anepisternum and anepimeron. Pubescence often conspicuous, sometimes strongly coloured; length and density most variable; species with very even, and with uneven pubescence occur. Pruinose bands, if present, are longitudinal, often coalescent anteriorly; in some cases weak crossbands occur along the dorsal suture. The scutellum is without specialized structures or specialized pubescence (fig. 5).

Wings: The wing surface is clear to partially or strongly infusate, in most species slightly, evenly troubled. All species show the *vena spuria* characteristic of the Syrphidae. Stigmal crossvein oblique, stigma absent; cell r1 open anteriorly; R4+5 strongly curving into r5, dm-cu proximally sinuous, distally rather strongly recurrent; r-m reaches M1+2 at approximately the middle of the anterior border of cell dm; no appending veinlets occur on R4+5 or dm-cu; the curves in CuA1 and dm-cu are smooth. The colour of the veins ranges from dark yellow to black and is rather constant within species. The alula is inconspicuous; the squama and antisquama (upper and lower calypters) are pale and bear a fringe of pale, yellow, even pubescence. The halteres usually are well clear of the thoracic pubescence; the stalk is yellow, the knob usually pale, sometimes dark (fig. 6, 23 d).

Legs: Legs 1 and 2 moderately robust. Leg 3 very robust, with specialized structures: a single, usually triangular projection on the femora 3 at the distal end in all *Merodon*. Various ridges and spines occur on the trochanters 3, femora 3, tibiae 3 and metatarsi 3 in the males, seldom so in the females, of many species. In several species the femora, the metatarsi, or both, may be swollen or modified strongly in the males, weakly in females. The colour is most variable, species with all orange and with all black legs occur. In many species the dark legs bear short, recumbent, golden pubescence giving a false impression of yellow leg colour. Specialized pubescences occur on the trochanters 3 where a tuft of stout hairs is found in some species, often inserted on a projection; on the tibiae 3 where a tibial floccus (a bunch of hairs) occurs in some species, in most cases inserted on a spur; and on the metatarsi 3 where stout short hairs occupy part of the lower face in some species (figs. 40 c, 42 d).

Abdomen: Outline variable, usually comparatively stout in the females, with some notable exceptions, more slender in the males. The abdominal apex in the males is posteriorly rounded with the genitalia often clearly visible, in females it is posteriorly rounded to more or less acute. In males of some species T IV is conspicuously swollen to hold the large genitalia. Colour in most species dark throughout with yellow lateral spots on T II; in other species all dark, or mainly to all red, yellow or orange. Pubescence often concolorous with surface, most variable in density,

evenness, length and colour; pruinose bands often present, in many cases combined with yellow to red background. These bands are quite variable in width and curvature throughout *Merodon* and are lacking altogether in several species. In the males S IV is usually slightly modified posteriorly; in some species large paired appendages or a strong keel occur (figs. 36 b, 39 c, 40 b, 41 d, 42 e, 43 e, 44 b).

Male genitalia: The male genitalia are often intricate and show enormous variation. They consist of two main parts, the aedeagus and the surstyle. Both parts are basally connected, by epandrium and basale respectively, to the inside of the genital cap. The aedeagus is relatively the least variable, consisting of a usually tapering shaft, which apically bears paired chitinous plates, encasing the sperm duct. These plates vary in shape, size and degree of sclerotization and can be recumbent, erect or intermediate. The outer face of the shaft may bear paired spines, lobes or strongly sclerotized plates, or may have a subbasal excavation. The inner face may show pubescence. The curvature of the aedeagus varies between species; both slender and stout aedeagi occur, while the apical shaft part (defined in fig. 10 a) may be weakly to strongly lengthened. The surstyle which envelops the cercus is much more variable. In its most simple form it consists of a paired, more or less S-shaped sclerotized plate, the apical part of which is identified as the posterior surstyle lobe which is always present. In most species additional lobes of the surstyle occur; often there is an anterior surstyle lobe which may either be free and projecting, or coalescent to various degrees with the posterior surstyle lobe; in some cases a middle surstyle lobe is present as well. The anterior and posterior surstyle lobes may bear accessory lobes and / or specialized pubescences. The cercus is variable in shape and in the length and density of the pubescence. The genital cap (S X of Metcalf 1921, S VIII of McAlpine 1981, T VIII of Speight 1987) encasing the genitalia proper does not show much variability, although in one species, *Merodon caudatus* Sack, 1913, this cap is strongly elongate and bears an apical floccus conspicuous to the naked eye (figs. 8-17).

Female genitalia: Simple, consisting of a telescope tube terminally fringed with pubescence (see figs. 52-55 in Speight 1987). The structure of female genitalia is quite uniform throughout *Merodon* and of little significance in establishing species groups or in species recognition.

Sexual dimorphism: Rather pronounced in most species. In species with dichoptic males, eyes of females wider apart. Metallic lustre in females usually less strong. Wings in females often less infusate. In females pubescence on head, thorax and abdomen shorter and duller, but in many species the pruinose bands on thorax and abdomen clearer. In species with

males showing interalar pubescence bands these are sometimes lacking in females.

Biology

Merodon is widely distributed over the Palaearctic and Ethiopian regions and contains about 150 species. In general, very little is known of the biology, in spite of several species being quite common. *Merodon* species may account for a considerable part of the Syrphidae in the fauna of a region or country. There are over 50 species of *Merodon* in Turkey, where many species are very common. In Israel about 20% of the Syrphid species belong to *Merodon* (Kaplan & Thompson 1981; 198).

The known larvae all develop in underground bulbs or rhizomes of monocotyledons. It is assumed that most if not all species share this way of life. Larvae were reared of *Merodon amaryllidis* Villeneuve de Janti, 1934 (Villeneuve de Janti 1934), *Merodon bombiformis* Hull, 1944 (Stuckenberg 1956) and *Merodon equestris* (Fabricius, 1794) (e.g. Lindner 1949).

In the temperate zone the larvae survive the winter underground. Various species occur in regions having severe winters, e.g. the eastern Turkish mountains at 3000 m altitude, where species of *Merodon* are common. The larvae are sheltered by the snow cover. On the other hand, *Merodon* occurs in tropical and subtropical regions as well. In these regions the larvae survive unfavourable climatic conditions, mainly drought, in their sheltered underground habitat. In relatively dry surroundings the various species seem to prefer relatively wet places (Hurkmans 1988). Some are mainly found at higher altitudes (e.g. Hurkmans 1988, Marcos García 1989) where lower temperatures cause less evaporation, and therefore less extreme drought. In view of these adaptations *Merodon* should be considered xero-tolerant rather than xerophilic. In the northern and moister parts of the range, *Merodon* occurs in relatively drier habitats. This probably reflects that dry areas warm up quicker in spring and therefore allow a longer season. This is important given the restricted flight period. In view of the overall distribution, *Merodon* can be considered thermophilous, but this holds true only for the flight period. Cold season or drought conditions seem less important in view of the sheltered conditions during larval development.

The various species of *Merodon* appear to have a preference for flowers of Umbelliferae (e.g. Šuster 1959, Hurkmans 1985, 1988).

Territorial behaviour was recorded in several *Merodon* species, e.g. by Fitzpatrick & Wellington (1983) and Hurkmans (1985, 1988). Defence of territories is more or less aggressive according to territo-

rial space available, presence of females, population density and weather. In some species the males emit piping sounds presumed to play a role in territorial defence and mating (Conn 1978; Treiber 1987; Hurkmans 1988).

Copulation is either airborne or sedentary; both modes may occur in the same species (Conn 1978; Hurkmans 1988) and may be linked with morphological differences (Conn 1978). *Merodon equestris* is capable of prolonged flight in copula. Duration of copulation is variable, from few seconds (Kabos 1939) to several minutes. In *Merodon rufus* copulation is accompanied by a loud piping sound (Treiber 1987).

During oviposition several modes appear to occur: Kabos (1939) recorded that in *Merodon equestris* eggs were not attached to plants but pressed into the soil, while Hurkmans (1988) found that in *Merodon loewi* (Van der Goot, 1964) the females pressed their abdominal tip to the stems of *Ornithogalum* plants as if ovipositing; regrettably no larvae could be reared from the plants dug out.

Apparently the number of generations per year varies throughout the range. Northern records are mainly from July, while Mediterranean records of a single species in one region may extend from May through September. Marcos García (1985) recorded that *Merodon avidus* (Rossi, 1790), and *Merodon aeneus* Meigen, 1822 are bivoltine in western-central Spain. Split occurrences of many species reflect only available collection data and do not indicate that these species are bivoltine.

Several species of *Merodon* have a dense and colourful pubescence and mimic bumblebees by their size and laborious flight, close to the soil. Brown (1951) noted that in *Merodon equestris* the colour forms most numerous in his samples mimicked the most common bumblebee. A cluster of small, strongly lustrous species resemble halictid bees in size, appearance and behaviour.

Division into species groups

The divisions of *Merodon* by Becker (1912), Sack (1913a) and Paramonov (1926b) are based on external similarities. The genitalia were not considered while some problematical species were not included in the species groups presented.

The subgenus *Exmerodon* Becker, 1912, established to accommodate the type-species [by original designation], *Merodon (Exmerodon) fulcratus* Becker, 1912, is based on the dichoptic condition in males of *fulcratus*. Sack (1913a, 1931) and Paramonov (1924-1937) did not follow Becker's subdivision. The subdivision by Becker is not followed here for two reasons: first, dichoptic males are also found in other

species not closely related to *fulcratus* and second, the *fulcratus* group does not occupy an isolated position.

A first attempt to present a subdivision based on synapomorphous characters, including those of the male genitalia, is given here for the species having arcuate pruinose bands and abdomina with tapering second tergite. These two characters are judged to be apomorphic. The corresponding plesiomorphic conditions are: straight, oblique pruinose bands and non-tapering abdomina.

Key to the species treated

Note: Several species had to be left out of the key. Their genitalia could not be checked, since type-material could not be studied. These are: *Merodon bes-sarabicus* Paramonov, 1924 (the types are presumably lost); *Merodon dobrogensis* Bradescu, 1982; *Merodon kiritshenkoi* Stackelberg, 1960; *Merodon tener* Sack, 1913 (the only types left are ♀, the ♂ types are presumably lost).

Males: Key to species groups and species

- A. No anterior surstyle lobe present on genitalia, *or*: the surstyle consists of one mass in which the anterior part may be differentiated (e.g. figs.); *or*: the outline of the surstyle ridge is fluent, semicircular or broadly rounded; *or*: anterior surstyle lobe weak, posterior lobe very long (African species); *or*: anterior surstyle lobe medially recurved, totally coalescent with surstyle mass; *or*: three surstyle lobes of equal size, separated by two very deep sulci; *or*: abdomen relatively stout, T II not tapering, pruinose bands parallel to posterior tergite margins ... key in part II of this monograph
 - Anterior surstyle lobe well-defined, moderately large to large, the surstyle lobes are well differentiated. The surstyle lobes are not all separated (by two deep sulci), if a middle lobe occurs it is small and coalescent with either anterior or posterior lobe, and the lobes are not of equal size. Anterior lobe not medially recurved and totally coalescent with stylus mass, but free (although the apex may be recurved). Abdomen relatively slender, T II (more or less strongly) posteriorly tapering, abdominal pruinose bands arcuate. Species fulfilling all these requirements can be identified using the following key.
1. Anterior surstyle lobe short, rounded, pubescent, coalescent with surstyle mass (*distinctus* assemblage)12
 - Anterior surstyle lobe more elongate, often well separated from surstyle mass, often with accessory lobes or specialized parts2
2. Anterior surstyle lobe narrow, posterior lobe me-

- diolaterally aligned, often overlapping (*alexexji* group)17
- Posterior lobe dorsoventrally aligned3
- 3. Basitarsi 3 swollen, with specialized (dense, short, golden) pubescence on medial face; ribiae 3 often with apical flocus; sternite IV often keeled or strongly modified (*tarsatus* group)25
 - Sternite IV never strongly modified, if keeled the basitarsi 3 normal4
- 4. Legs all dark, many species with conspicuous pubescence; anterior surstyle lobe wide, elongate, large (*clavipes* group)32
 - Legs partly yellow5
- 5. Flanges present on outer face of aedeagus (*elegans* group)42
 - No such flanges present6
- 6. Secondary, lateral lobe present on posterior surstyle lobe; femora 3 much swollen, tibiae and tarsi all yellow; anterior surstyle lobe large, rather elongate, moderately wide; aedeagus with apical shaft part normal (*vandergooti* group)
 - *vandergooti* sp. n.
 - No secondary lateral lobe, or if present, femora 3 less swollen, anterior surstyle lobe narrow, elongate, ventrally recurved, anterior surstyle lobe narrow, ventrally recurved, apical shaft part of aedeagus lengthened7
- 7. Anterior surstyle lobe separated from surstyle mass by a sulcus8
 - Genitalia not with sulcate surstylus 9
- 8. Large species, averaging 17 - 21 mm body length; abdomen predominantly yellow, antennae normal (*pruni* group) *pruni* Rossi
 - Smaller species, 7 - 15 mm, abdomen dark with crimson or dark red, antennae notably to extremely lengthened (*longicornis* group)45
- 9. Posterior surstyle lobe with large, ventral accessory lobe (*crassifemoris* group)
 - *crassifemoris* Paramonov
 - This lobe without large ventral accessory lobe
- 10. Apical shaft part of aedeagus lengthened; anterior surstyle lobe usually not apically widened but if so, then bifid (*alagozicus* group)46
 - Apical shaft part normal, anterior surstyle lobe apically widened, not bifid11
- 11. Aedeagus with 2 pairs of spines on outer face, anterior surstyle lobe rectangular to diamond-shaped (*nigritarsis* group)52
 - Aedeagus smooth, anterior surstyle lobe ending in spatulate-semicircular apex (*avidus* group) ...
 - *avidus* (Rossi)
- 12. Femora 3 very much swollen13
 - Femora 3 only moderately swollen14

13. Larger species, body length 13 - 15 mm; genitalia: aedeagus stouter, apical shaft of aedeagus shorter *femoratus* Sack
- Smaller species, body length 10 - 13 mm; genitalia: aedeagus slenderer, apical shaft of aedeagus longer *clunipes* Sack
14. Thorax and abdomen densely yellow pubescent; abdomen stout, T II strongly tapering; genitalia: both surstyle lobes elongate; body length 15 mm *mariae* sp. n.
- Pubescence less dense, abdomen slenderer; if body length approx. 15 mm then abdomen very slender 15
15. Genitalia: Posterior lobe very short; third antennal article subacute - acute; pubescence overall very long and thin *ottomanus* sp. n.
- Genitalia: Posterior lobe longer; third antennal article obtuse 16
16. Body length 13 - 15 mm; both surstyle lobes coalescent; abdomen very slender, dark with large yellow lateral spots *distinctus* Palma
- Body length 9-12 mm; surstyle lobes separated by a sulcus; abdomen yellow throughout *testaceoides* sp. n.
17. Genitalia: Anterior surstyle lobe showing elongate bald area; S IV deeply emarginate posteriorly *marginicornis* sp. n.
- Anterior surstyle lobe without bald area 18
18. Genitalia: Posterior surstyle lobe with rounded bald knob in antero-lateral part 19
- No such knob present, or knob very weak 21
19. Both surstyle lobes short; cercus relatively large, short, wide; T II with orange lateral spots bearing submetallic lustre; apical part of aedeagus covered by overlapping posterior surstyle lobes *sophron* sp. n.
- Both surstyle lobes longer, cercus relatively smaller, more elongate; no submetallic lustre on lateral spots; aedeagus entirely visible 20
20. Pubescence on thorax and abdomen recumbent to oblique, golden; triangular process with clear apical spur and short stout bristles *alinosus* sp. n.
- Pubescence on thorax and abdomen less conspicuous, erect; no clear apical spur on triangular process which bears longer, less stout bristles *alexexi* Paramonov
21. Anterior surstyle lobe with length/width ratio 1.2 - 1.3 in lateral view; posterior surstyle lobe short, rather spatulate in ventral view, coalescent *kawamurae* Matsumura
- Anterior surstyle lobe with length/width ratio of 2.0 or over; if posterior surstyle lobe short: accessory lobe present where anterior and posterior lobes meet, and anterior lobe strongly spatulate 22
22. Antennal ratio 2.1; genitalia: cercus placed far ventrad; accessory lobe present on posterior surstyle lobe; anterior lobe very elongate (an inconspicuous bald knob present antero-medially on posterior surstyle lobe) *alexexi* Paramonov
- Antennal ratio under 2.0; genitalia: cercus in normal position; no accessory lobe on posterior surstyle lobe 23
23. Abdomen with strong golden lustre; genitalia: anterior surstyle lobe widest in its mid-region; aedeagus with two separate subapical cavities, apical shaft part slightly lengthened *hypochrysos* sp. n.
- Abdomen without strong golden lustre; genitalia: anterior surstyle lobe equally wide throughout, or spatulate; aedeagus with one subapical cavity 24
24. Touchline of compound eyes incomplete, very short; all legs with tarsi orange, tibiae orange with wide dark distal band; genitalia: anterior surstyle lobe equally wide throughout *rufitarsis* (Sack)
- Touchline complete, tl-v ratio 0.9; all legs dark except joints; genitalia: anterior lobe somewhat spatulate *hirsutus* Sack
25. Genital cap much elongate, with floccus *caudatus* Sack
- Genital cap normally shaped, without floccus 26
26. S IV normal, slightly arched, emarginate posteriorly; basitarsi 3 with length/width ratio 2.5 and dense, short, golden pubescence on lower face; clear apical floccus present on tibiae 3 *auronitens* sp. n.
- S IV with small (single or paired) median projection 27
- S IV with large paired appendages 29
27. Antennal ratio over 2.8 *tangerensis* sp. n.
- Antennal ratio under 2.3 28
28. Antennal ratio approx. 2.1; S IV with small projections; legs pale brown *xanthipous* sp. n.
- Antennal ratio approx. 1.3; S IV with single median projection ending in acute spine *ankylogaster* sp. n.
29. S IV with long slender appendages; posterior proximal face of basitarsus 3 showing ovoid area of widely spaced setaceous pubescence bordered by long setae; apical floccus of tibiae 3 inserted on apical spur *tarsatus* Sack
- S IV with less long, robust appendages; if specialized area present on basitarsi 3, pubescence in centre and on margin similar 30
30. Genitalia: anterior surstyle lobe widening apically, angular, its apical part projecting ventrad, with a fringe of short yellow pubescence *persicus* sp. n.
- Genitalia: anterior lobe not widened apically, not projecting ventrad 31

31. Head: antennal ratio over 2.0; leg 3: length/width ratio of basitarsus 2.0; genitalia: anterior surstyle lobe tapering apically; aedeagus rather stout
 *turkestanicus* Paramonov
- Head: antennal ratio approx. 1.6; leg 3: length/width ratio of basitarsus 1.4; genitalia: anterior surstyle lobe slightly spatulate; aedeagus slenderer
 *oidipous* sp. n.
32. Wings strongly infusate, deep brown except apically; large species (body length 15 - 18 mm)
 *velox* Loew
- Wings clear or slightly infusate (yellowish at most)33
33. Thorax and abdomen densely pubescent, obliterating background colour; pubescence often reddish or yellow38
- Thorax and abdomen moderately dense pubescent, surface well visible34
34. Pubescence on thorax uniform; relatively stout species, with T II only moderately tapering35
- Pubescence on thorax with dark interalar band; T II strongly tapering, slenderer species36
35. Genitalia: anterior surstyle lobe with long stalk; posterior lobe anteriorly with a low well-defined projection bearing dense pubescence; aedeagus rather stout; body length 14-15 mm
 *warneckei* sp. n.
- Genitalia: anterior surstyle lobe with short stalk; dense hair-tuft anteriorly on posterior lobe not inserted on a projection; aedeagus slender; body length 12 mm
 *brevis* Paramonov
36. Triangular processus modified, ending in large hooked spur; 3rd antennal article orange; Body length 14-15 mm
 *hamifer* Sack
- Triangular processus on femora 3 normally shaped; abdomen slender, with bronze lustre; body length 10-15 mm37
37. Body length 11 - 15 mm; abdomen slender, with bronze lustre; pubescence yellow, rather dense; legs dark throughout
 *aberrans* ssp. *aberrans* Egger
- Body length 12 - 14 mm; abdomen slender, with bronze lustre; legs with yellow markings
 *aberrans* ssp. *flavitibius* Paramonov
- Body length 10 - 11 mm; abdomen extremely slender; with slate grey lustre and often purple reflections; pubescence grey to greyish yellow, rather sparse; legs dark throughout
 *aberrans* ssp. *isperensis* sp. n.
38. Large species (body length 17 - 22 mm)
 *clavipes* Fabricius
- Smaller species (body length up to 16 mm)39
39. Femora 3 normally swollen; triangular processus with a strong, erect, apical spur; body length 12 - 13 mm40
- Femora 3 very much swollen; triangular processus without apical spur, or this spur low, stout; body length 14 - 16 mm41
40. Tarsus 3: stout, with first article twice as long as second; apical spur of triangular processus on femora 3 shorter; pruinose band on T IV chevron-shaped
 *karadaghensis* Zimina
- Tarsus 3: slender, first article 1.4 x as long as second; apical spur of triangular processus on femora 3 erect, longer; pruinose band on T IV rounded
 *dzhaliatae* Paramonov
41. Antennal ratio 1.4; body length 14 - 16 mm; triangular processus on femora 3 finely serrate, normal
 *cupreus* sp. n.
- Antennal ratio 1.8; body length 13 mm; triangular processus strong, with slight apical spur
 *splendens* sp. n.
42. Anterior surstyle lobe with rounded profile; sulcus between both surstyle lobes marked, but not very deep or wide; aedeagus rather stout43
- Anterior surstyle lobe with angular profile; sulcus between both surstyle lobes very wide; aedeagus slenderer44
43. Head: oa 35°; abdomen very slender; anterior surstyle lobe with lateral ridge; flanges on outer face of aedeagus low
 *testaceus* Sack
- Head: oa 50°; abdomen moderately slender; anterior surstyle lobe without lateral ridge; flanges on aedeagus higher
 *manicatus* Sack
44. Pruinose bands on abdomen conspicuous; S IV strongly arched; triangular processus on femora 3 bearing 6 - 9 bristles; posterior surstyle lobe with free anterior part separated by an oblique sulcus; cercus long, well projecting posteriorly
 *elegans* sp. n.
- Pruinose bands inconspicuous but visible; S IV strongly arched; triangular processus bearing 10 bristles; posterior surstyle lobe without free anterior part; sulcus rather quadrate; cercus shorter, not much projecting
 *bequaerti* sp. n.
45. Antennal ratio 4.0 - 4.5
 *longicornis* Sack
- Antennal ratio 2.5 - 3.0
 *kaloceros* sp. n.
46. Anterior surstyle lobe stalked, widening apically47
- Anterior surstyle lobe narrow throughout48
47. Both surstyle lobes separated by a deep sulcus
 *taniniensis* sp. n.
- Surstyle lobes coalescent; anterior lobe bifid
 *toscanus* sp. n.
48. Anterior surstyle lobe recurved mediad
 *nitidifrons* sp. n.
- Anterior lobe recurved ventrad to ventro-caudad49
49. Anterior lobe recurved ventro-caudad, apical part more or less parallel with basal part50
- Anterior lobe recurved ventrad, apical part protruding51

50. Tibiae 3 without large distal spur; posterior surstyle lobe with semicircular ventral projection
.....*lucasi* sp. n.
- Tibiae 3 with large, triangular spur; posterior lobe without semicircular projection; lateral spots on T II with postero-lateral digitiform dark indentation*alagoezicus* Paramonov
51. Anterior surstyle lobe simple; surstyle guarded by large lateral sclerotized plate, projecting far caudad; posterior surstyle lobe straight; aedeagus basally stout*schachti* sp. n.
- Anterior lobe with accessory lobe; no guarding lateral plate; posterior lobe twisted; aedeagus slender throughout*saidagensis* sp. n.
52. Anterior surstyle lobe with apical part rhomboidal; posterior lobe higher; aedeagus with outer face all convex; trochanter 3 often with clear knob; rather robust species*nigritarsis* Rondani
- Anterior surstyle lobe suddenly widened apically, profile of apical part quadrate; posterior lobe lower; aedeagus concave on basal outer face; trochanter 3 smooth; slenderer species*femoratoides* Paramonov
- is more greyish, while the abdomen is slenderer than in the nominal subspecies; the ssp. *flavitibi-*
us, of which no records exist postdating the publication of the original description, shows yellow leg markings)*aberrans* Egger
- Habitus similar, triangular process ending in large hook*hamifer* Sack
8. Thoracic pubescence unicolorous, species of some 12 mm, bands on abdomen rather clear, nearly continuous, paired pruinose spots on T II*hirsutus* Sack
- Thoracic pubescence bicolorous9
9. Thoracic pubescence grey, dark interalar pubescence band present*cupreus* sp. n.
- Thoracic pubescence golden, but clearly paler posteriorly; relatively stout species with marked apical spur on triangular process
.....*karadaghensis* Zimina
10. Larger species, over 12 mm, densely pubescent at least on thorax, abdomen dark, blackish pubescent, with 2 pairs of outstanding, snow-white pubescent spots*quadrinotatus* (Sack)
- Smaller species, sparsely pubescent throughout, slight bluish lustre on thorax and abdomen, basitarsus 3 swollen; body length 7.5 - 9 mm
.....*turkestanicus* Paramonov
11. Thorax with pruinose bands12
- Thorax without bands, tibiae and tarsi partially dark, basitarsi 3 rather swollen13
12. Species strikingly black-and-white with strong pruinose bands on abdomen*femoratus* Sack
- Duller coloured species, bands inconspicuous
.....*warnckei* sp. n.
13. Bluish lustre on thorax and abdomen, pruinose abdominal bands nearly continuous
.....*ankylogaster* sp. n.
- No bluish lustre, bands interrupted
.....*tarsatus* Sack
14. Well marked whitish pruinose bands present on thorax15
- Pruinose bands on thorax very weak, or longitudinal metallic bands present, or bands of different colour32
- Thorax unicolorous, without traces of bands...36
15. Tergite II posteriorly strongly tapering, thorax with strong pruinose bands and extremely short, even pubescence; habitus very slender, body length 14 - 15 mm16
- Tergite II less tapering or habitus stouter, or smaller or larger species, thoracic pubescence longer17
16. Femora 3 reddish to orange; midstripe on frons extremely narrow*distinctus* Palma
- Femora 3 dark, midstripe normal
.....*biarcuatus* Curran
17. Antennal ratio 2.2 or more18

Key to females of species

1. Abdomen dark throughout on surface (the pubescence may be brightly coloured!), often metallic lustrous, without red or yellow lateral spots ...
.....2
- Abdomen showing yellow, orange or red lateral spots on T II, or with even more extensive yellow or red on abdomen14
2. Legs all dark, at most femoral apices and tibial bases very narrowly paler (but check 7: *M. aberrans* ssp. *flavitibius*)3
- Legs with yellow markings11
3. Pruinose bands present on abdomen, pubescence on posterior abdomen concolorous4
- No pruinose bands present on abdomen10
4. Abdomen slenderer, in some cases with clear bluish lustre5
- Abdomen stouter, dark, not clearly bluish lustrous (but if clear grey lustre is present, see 7: *aberrans* ssp. *isperensis*)8
5. Femora 3 greatly swollen6
- Femora 3 normal, not much swollen7
6. Abdominal surface colour brownish, with narrower pruinose bands*clunipes* Sack
- Abdominal surface colour blackish, with wider pruinose bands, thorax bearing pruinose
.....*femoratus* Sack
7. Abdomen with bluish metallic lustre, thorax often with inconspicuous pruinose bands; wings apically slightly infusate; femora straight; triangular processus normally shaped; body length 13 - 15 mm (in the ssp. *isperensis* the metallic lustre

- Antennal ratio 2.0 or less21
- 18. Abdomen relatively stout, tapering posteriorly ...
 - Abdomen slenderer, more cylindrical, lateral spots extended over much of 2nd tergite at least, in many cases over 3rd as well, crimson coloured20
- 19. Femora slender, abdomen with grey hue produced by overall whitish pubescence; no blue lustre on abdomen*kaloceros* sp. n.
 - Femora swollen, abdomen dark with bluish lustre*lusitanicus* sp. n.
- 20. Antennal ratio 3.4 to 5.0*longicornis* Sack
 - Antennal ratio 2.2 to 2.8*erivanicus* Paramonov
- 21. Legs dark throughout22
 - Legs yellow marked, or all yellow/orange23
- 22. Large, robust species (17 mm), wings often infusate, thorax with dense pubescence*velox* Loew
 - Smaller species (8 - 11 mm), wings clear*alexexi* Paramonov
- 23. Large species (17 - 21 mm), wings slightly infusate, abdomen clearly conoid in outline*pruni* Rossi
 - Smaller species up to 15 mm, abdomen more cylindrical24
- 24. Abdomen mainly pale orange, slender, pruinose bands on abdomen arcuate, posterior end of abdomen acute*testaceus* Sack
 - Abdomen mainly dark25
- 25. Antennal ratio 2.0, triangular processus strongly serrate*affinis* Gil Collado
 - Antennal ratio up to 1.726
- 26. Tarsi 3 with dark upper face and contrasting, golden pubescence on sides; pruinose bands on thorax inconspicuous*nigritarsis* Rondani
 - Tarsi without this contrast or if so, thorax with outstanding bands27
- 27. Legs nearly all orange*aureotibia* sp. n.
 - Legs with extensive dark surface28
- 28. Abdomen relatively lustrous, thorax with strong pruinose bands, often a fifth anteromedial band present*alagozeicus* group

Comprising the following species: *alagozeicus* Paramonov, *lucasi* sp. n., *niridifrons* sp. n., *sadagensis* sp. n., *schachtii* sp. n., *taniniensis* sp. n. and *toscanus* sp. n. These species cannot at present be well separated in the female sex, as the pairing with the males is not certain. *M. toscanus* is known only from Italy, the other species are mainly known from Turkey.

 - Abdomen duller, usually no 5th band on thorax29
- 29. Small species, about 10 mm body length, thorax clearly but weakly banded*tener* Sack
 - Larger species, 12 mm or over, bands more marked30
- 30. Frontal depression present; 2nd tergite bright orange*elegans* sp. n.
 - No depression on frons31
- 31. Femora 3 swollen, curved*femoratoides* (Paramonov)
 - Femora 3 less swollen, straighter*avidus* Rossi
- 32. Legs all dark33
 - Legs at least with yellow markings, thorax rather dull, dark34
- 33. Femora 3 strongly swollen, abdomen bluish lustrous, body length 10 - 13 mm*lusitanicus* sp. n.
 - Femora 3 slenderer, if in doubt: no blue abdominal lustre; approx. 17 mm, wings infusate*velox* Loew
- 34. Large species, 17 - 22 mm, wings often infusate*pruni* Rossi
 - Smaller, up to 15 mm35
- 35. Abdomen mainly orange, legs dark*manicatus* Sack
 - Abdomen mainly dark, third antennal article slender, acute to subacute, size 7.5 - 10 mm, pruinose abdominal bands conspicuous*kawamurae* Matsumura
- 36. Lateral spots on abdomen fiery orange or red, basitarsi 3 widened*caudatus* Sack
 - Lateral spots less conspicuous, abdominal pubescence bands clear, large to very large species37
- 37. Large species, 12 - 15 mm, abdomen stout with parallel, often yellow pruinose, conspicuous bands*mariae* sp. n.
 - Very large species, 17 - 22 mm, bands whitish, less conspicuous, or dense pubescence obliterating pruinosity*clavipes* (Fabricius)

SYSTEMATIC PART

The *distinctus* assemblage

This set is a paraphyletic group sharing no other than the 'general' synapomorphies of this section of the genus, viz. the tapering T II and arcuate pruinose bands.

Merodon biarcuatus Curran (figs. 21 a-c, 103)

Merodon biarcuatus Curran, 1939: 7. Holotype ♀: 'Forest of Namora, Robot, Morocco' [near Rabat, approx. 33° 55' N, 7° W] (AMNH) [examined].

Material examined. – France: 2♀ (BMNH, RMNH); Greece: 1♀ (ZMAN); Italy: 3♀ (NHMW, ZMAN, WH); Morocco: 2♀ (RMNH); Turkey: 12♀ (JLR, ZMAN, BMNH, WH).

Description

Female. – Head: Antennae orange, antenna 3 with upper margin convex, apex rounded, antennal ratio

2.2, ocellar angle 55°; pubescence pale yellow, rather sparse, erect, but moderately dense and darker on median, lustrous 1/3-1/6 of frons and on vertex; face densely pruinose except on narrow median line.

Thorax: Katepisternum, anepisternum and anepimeron, lateral dorsum and scutellum lustrous, bearing very short yellow even oblique pubescence; dark intaralar band present. Wings clear; halteres, squamae and antisquamae pale orange to yellow.

Legs: Trochanters brown, femora dark, tibiae and tarsi orange to yellow; pubescence yellow, trochanter 3 smooth, femora 3 swollen with normal triangular processus bearing 7-9 bristles on serrate distal margin, apical bristle conspicuous.

Abdomen: Extremely slender; T II orange, sometimes with small dark medio-anterior lunule, strongly tapering; T III with conspicuous wide arcuate whitish pruinose band, background orange anterior, dark posterior to band; T IV-V dark, with conspicuous arcuate pruinose band on T IV; pubescence on all tergites concolorous to pale throughout.

Body length 13-17 mm.

Male. – Unknown.

Diagnosis. – The extremely slender habitus will distinguish this species from other species, but *M. biarcuatus* is apparently closely related to *distinctus*. The pubescence on the frons of *distinctus* female is denser, oblique and golden; the lustrous midstripe is narrower, occupying 1/8 of its width; the pubescence on the thoracic dorsum is darker and shorter; the femora 3 are orange (dark in *biarcuatus*); the pruinose bands on the abdomen are narrower.

Period of flight and distribution (fig. 103). – This species seems to occur throughout the mediterranean where it flies from May to August.

Merodon clunipes Sack

(figs. 22 a-c, 104)

Merodon clunipes Sack, 1913a: 444. ♂ Holotype: 'Smyrna 49417' 'Billar' (on lower face of same label) [= Izmir, Turkey] (ZMHB) [examined].

Merodon clunipes, Peck 1988: 169.

Lampetia clunipes, Sack 1931: 311.

Material examined. – Austria: 1♂, 1♀ (RMNH); France: 15♂, 2♀ (RMNH); Greece: 15♂, 5♀ (NHMW, KBIN, RMNH, JLR, WH, MNHN); Hungary: 1♀ (RMNH); Italy: 14♂, 7♀ (NHMW, RMNH); Lebanon: 2♂, 1♀ (NHMW, KBIN); Spain: 1♂ (RMNH); Switzerland: 1♂ (RMNH); Turkey: 14♂, 12♀ (BMNH, NHMW, ZMAN); Yugoslavia: 10♂, 1♀ (RMNH).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin convex, apex rounded, antennal ratio 1.2,

pubescence dense, especially on face, erect, pale yellow; vertex angle 35°, ocellar angle 45°, tl-v ratio 0.5.

Thorax: Dark, without conspicuous lustre; pubescence dull yellow, pruinose bands clear. Wings very slightly infusate; halteres, squamae and antisquamae yellow.

Legs: Femora dark, tibiae 1-2 apically brownish, tibiae otherwise dark; tarsi brownish, darker apically; trochanter 3 with ridged projection; femora 3 very much swollen, curved, with normally shaped triangular processus bearing 8-9 bristles on strongly serrate distal margin.

Abdomen: Dark; slender to very slender; T II-IV bearing arcuate somewhat vague rather wide pruinose bands; pubescence dark, paler laterally and on T IV; densest on pruinose bands of T II; S IV narrowly emarginate posteriorly.

Genitalia: Anterior surstyle lobe rather short, rounded, bearing dense, short, yellow, even pubescence throughout, showing a ridge bearing 5-6 strong bristles on medial face; posterior surstyle lobe coalescent, elongate, posteriorly with dense, moderately long, yellow pubescence. Cercus rounded, bearing long, yellow pubescence. Aedeagus moderately long, apical shaft part slightly lengthened, fringed plates on thecal apex recumbent.

Body length 8.5-13 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Ocellar angle 50°, frons with lustrous midstripe occupying 1/3 of width. Thorax: Pruinose bands quite conspicuous, pubescence less dense, rather recumbent on sides. Legs: Apices of femora paler, femora 3 less swollen, but if compared to females of other *Merodon* species still very much so. Abdomen: T II largely reddish to orange laterally, this colour may extend over T III as well; dark parts brown, not black.

Body length 9-12 mm.

Diagnosis. – The males of this species are rather similar to *femoratus* from which they differ in being smaller (range 8.5-13 vs. 12-16 mm) and having a more slender aedeagus with slightly lengthened apical shaft part. In the females the size ranges are 9-12 and 12-17 mm in *clunipes* and *femoratus*, respectively; the females of *clunipes* have a more slender abdomen with clear orange markings (all dark in *femoratus* females) with vague bands; the bands in the females of *femoratus* are conspicuous and sharply bordered.

Variation. – The ridge on trochanter 3 is rather variable in size, and seems correlated with specimen size: small specimens have small ridges, large specimens having large ones.

Period of flight and distribution (fig. 104). – This

species occurs through central Europe and the northern Mediterranean where it flies in June and July.

Discussion. – One of the NHMW specimens identified as *clunipes* has an identification label '*M. striatus* Sack det. Sack'. As far as could be traced, this name is unpublished.

Merodon distinctus Palma

(figs. 23 a-d, 103)

Merodon distinctus Palma, 1863: 46. Holotype ♂: 'from the field of Sanseverino' [in the vicinity of Naples, Italy] [not located, not examined].

Lampetia dimorpha Szilady, 1940: 66. Holotype ♂: (and ♀ Paratype) 'Karacabey bei Brussa' [West of Bursa, Turkey on coast of Marmara inland sea] [lost, formerly in TMA, not examined]. Syn. n.

Merodon distinctus, Rondani 1868a: 22; Sack 1913a: 444; Peck 1988: 169.

Lampetia distincta, Sack 1931: 313.

Material examined. – France: 1♂ (BMNH); Greece: 23♂, 6♀ (KBIN, RMNH, BMNH, NHMW, JLR, WH); Italy: 1♂ (BMNH); Turkey: 5♀ (JLR); U. S. S. R.: 1♀ (RMNH); Yugoslavia: 1♂, 2♀ (JLR, RMNH).

Description

Male. – Head: Antennae bright orange, antenna 3 with upper margin convex, apex obtuse, antennal ratio 1.5, pubescence golden with dark tuft in ocellar region; vertex angle 40°, ocellar angle 45°, tl-v ratio 0.6.

Thorax: Dark, velvety lustrous on sides produced by recumbent pubescence, with clear pruinose bands on dorsum; pubescence golden, short, even. Wings clear; halteres, squamae and antisquamae yellow.

Legs: All femora dark, not black, femora 1-2 apically often brown to orangish; tibiae and tarsi yellow, legs with conspicuous golden pubescence throughout; trochanter 3 bearing distinct knob with apical obtuse ridge; femora 3 slightly swollen, rather straight, triangular processus with serrate distal margin; in some specimens vague orange spot present basally on femora 3; tibiae 3 rather abruptly widened distally (best seen in posterior view).

Abdomen: Slender; T II-IV dark with rather wide sharply defined arcuate yellowish pruinose bands, narrowly to hardly interrupted, the band on T IV widened laterally and in some specimens slightly recurved; T II with conspicuous yellow lateral spots; pubescence concolorous with surface; sternites I-III yellowish orange, IV darker, narrowly emarginate posteriorly, clearly though not strongly vaulted.

Genitalia: The anterior surstyle lobe short, rounded, with even, yellow, short, dense pubescence, coalescent with posterior surstyle lobe which is low and

elongate and bears long, erect, yellow pubescence. Cercus rounded to obtusely angular, with same pubescence. Aedeagus rather stout, slightly tapering, apical shaft part somewhat lengthened, fringed plates on thecal apex rather wide and recumbent.

Body length 12-16 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Midstripe on frons occupying 1/8 of width or even less; antenna 3 with dark upper margin in some specimens. Thorax: Pruinose bands more conspicuous, a thin praesutural crossband present in some specimens; pubescence extremely short, as if shaven; pubescence in mid region of dorsum often dark. Legs: Deep orange to yellow all through, but triangular processus often darker. Abdomen: Even more slender than in ♂; lateral spots larger, deeper coloured, pruinose bands less wide; T V bearing arcuate wide pubescence band; pubescence shorter than in ♂.

Body length 13-15 mm.

Diagnosis. – The combination of the very slender habitus, clear, sharply bordered pruinose bands, large lateral spots and genital structure will easily separate the males of *distinctus* from any other *Merodon*. The females are separated from the females of most other species by their relatively large size and extremely slender habitus. They can be separated from the females of the *alagoezicus* group by the more cylindrical abdomen, and from the very similar females of *biarcuatus* by the narrower frontal midstripe and the orange femora 3.

Period of flight and distribution (fig. 103). – *M. distinctus* occurs from May through August in the mediterranean parts of Europe and Turkey.

Discussion. – *M. dimorphus* Szilady, 1940 is tentatively considered a synonym of *distinctus*. In the original description *dimorphus* is stated to be allied to *clunipes* Sack, but the description points to very apparent differences with that species. From the description it can be inferred that *dimorphus* is very similar to, if not conspecific with, *distinctus*; the only difference apparent from the description is the colour of the pubescence on the head which is said to be pale in *dimorphus*. Regrettably several features are not or very superficially described; the 'spots' on the abdomen may either be lateral spots or pruinose bands, or both. The figure of the thoracic dorsum as given by Szilady closely resembles this element in *distinctus*. No material of *dimorphus* was examined, as the type-material (formerly in TMA), the only material known, was lost in 1956 (Dr. A. Dély-Draskovits, in litt.).

Merodon femoratus Sack
(figs. 24 a-b, 104)

Merodon femoratus Sack, 1913a: 446. Syntypes: 'Korsika, Griechenland und Kleinasien' [Corsica, Greece and Turkey]; depository unknown [not examined].

Merodon femoratus; Van der Goot 1981: 216, 218; Peck 1988: 169.

Lampetia femorata; Sack 1931: 315; Séguy 1961: 179.

Material examined. – Greece: 2♂, 5♀ (ZMUC, BMNH, KBIN, ZMAN, WH); Italy: 4♂ (ZMAN); Turkey: 15♂, 35♀ (JLR, BMNH, ZMAN, WH).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin convex, apex obtuse, antennal ratio 1.8; pubescence pale yellow, face and occiput densely white pruinose; vertex angle 35°, ocellar angle 45°, tl-v ratio 0.5.

Thorax: Dark, katepisternum, anepisternum, anepimeron, lateral dorsum and scutellum metallic lustrous, hardly pruinose except four longitudinal bands on dorsum; pubescence pale brown, moderately dense, erect, more even on dorsum but less so on sides. Wings very slightly infusate; halteres, squamae and antisquamae pale brown.

Legs: Dark, except for apices of femora and bases of tibiae of legs 1-2; trochanter 3 showing conspicuous hump, femora 3 very strongly swollen, strongly curved, with normally shaped triangular processus with strongly serrate, sometimes undulating margin bearing 5-10 bristles.

Abdomen: Dark; rather slender; T II tapering, without lateral spots; T II-IV with interrupted moderately wide strongly arcuate whitish pruinose bands; pubescence concolorous, densest laterally on T II; S IV strongly vaulted, deeply narrowly emarginate posteriorly.

Genitalia: The anterior surstyle lobe short, rounded; bearing even, erect, short, dense, yellow pubescence apically; coalescent with posterior surstyle lobe, which shows long yellow pubescence posteriorly, is elongate and medio-laterally aligned apically. Cercus wide, short, rounded, not far protruding beyond posterior surstyle lobe, bearing dense, long, yellow pubescence. Aedeagus short, stout, smooth on outer face, fringed plates on thecal apex rather wide, recumbent.

Body length 12-16 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Ocellar angle = 50° to 60°, frons with lustrous midstripe occupying 1/4 of width. Thorax: Pruinose bands wider and clearer, often striking. Abdomen: Distinctly wider, typically black-and-white patterned, pruinose bands slightly less arcuate.

Body length 12-17 mm.

Diagnosis. – *M. femoratus* is nearly similar to *clunipes* from which it is distinguished in both sexes by the greater size (12-17 mm vs. 9-12 in *clunipes*), in the males by the stouter aedeagus, and in the females by the black and white abdomen (brownish red in *clunipes*). From other species it differs in having a combination of very strongly swollen and curved femora 3 and very simple anterior surstyle lobe in the males, and by a combination of strongly curved and swollen femora 3 and a striking black-and-white abdomen in the females.

Period of flight and distribution (fig. 104). – *M. femoratus* occurs in southern Europe and Turkey from May through August, both in lowland and mountain habitats (up to over 2000 m). It is absent from the western Mediterranean.

Merodon mariae sp. n.
(figs. 25 a-c, 105)

Type-material. – ♂ Holotype 'France, Corse V. S. van der Goot / Asco 620 m [42. 15' N, 9. 10' E] 11.vii.1967' (ZMAN). – Paratypes: 29♂, 10♀: same data as holotype 2♂, 1♀ (ZMAN); topotypic, 20.vii.1956, leg. v.d. Goot, 1♀ (ZMAN); topotypic, 5/6.vii.1961, leg. J. A. W. Lucas, 7♂ (JLR); topotypic, 9/11.vii.1967, leg. Lucas, 3♀ (JLR); topotypic, 1/11.viii.1959, leg. P. M. F. Verhoeff, 1♂ (ZMAN); topotypic, 25.vii.1977, leg. P. Goeldlin, 2♂ (coll. Goeldlin, Lausanne); topotypic, 27.vii.1977, leg. P. Goeldlin, 5♂ (coll. Goeldlin, Lausanne); 'Corsica, La Foce de Vizzavona, 30.vi/ 31.vii.1893, Col. Yerbury' 5♂ (BMNH); 'Corte, Corsica, 2.vii.1893, Col. Yerbury' 1♂, 1♀ (BMNH); 'Evian, Corsica, 19.vii.1899 Col. Yerbury' 1♂ (BMNH); 'Corsica, Vizzavona 900 1000 m, 2.x.1906, leg. F. Guglielmi' 1♂ (BMNH); 'Italia Sardegna Alghero 27/28.iv.1957, leg. C. A. W. Jeckel' 1♂ (ZMAN); 'Italia Sicilia Misterbianco 215 m, 27.v.1966 leg. H. J. P. Lambeck' 1♂ (JLR); 'Environs de Salonique [Thessaloniki, Greece], Region du Mt. Profitis Ilias 768 m, Dr. A. Berton v.1918' 1♀ (MNHN); 'Greece, Phokis, Delphi 19/22.v.1984, 700-850 m, leg. W. Hurkmans' 2♂, 1♀ (WH).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin straight, slightly sulcate longitudinally, apex acute, antennal ratio 1.6; vertex angle 25 to 30°, ocellar angle 40°; pubescence whitish yellow with dark tuft in ocellar region, very dense above antennae, causing silky lustre; tl-v ratio 0.35.

Thorax: Dark, katepisternum, anepisternum, anepimeron, lateral dorsum and scutellum slightly lustrous; pubescence rather dense, deep yellow, very even, short; vestigial longitudinal bands present in most specimens. Wings slightly infusate; halteres, squamae and antisquamae pale yellow.

Legs: Dark, but tibial bases yellow marked; basitar-

sus 2 brown, not black in many specimens; trochanter 3 smooth, femora 3 slightly swollen, rather straight, triangular process with distal margin wavy, weakly serrate, but apically with two strong pedestals, holding 6-9 bristles; tibiae 3 with short rounded apical spur on inner face, basitarsi 3 somewhat swollen.

Abdomen: Mainly yellow; moderately slender, T II conspicuously tapering; T II-IV bearing slightly arcuate, narrowly interrupted to continuous pale yellow pruinose bands and showing dark brown anterior strips and posterior lunules; pubescence erect to oblique, rather dense and long, pale orange to golden throughout; S IV strongly vaulted, posterior margin entire.

Genitalia: Anterior surstyle lobe apically bearing short, even, yellow pubescence; subapical-medial accessory lobe seen as acute angle in lateral view; coalescent with posterior surstyle lobe; this lobe very elongate, low, posteriorly showing long, erect, rather dense, yellow pubescence and bearing a subapical, medial accessory lobe as well. Cercus large, elongate, with membranous ventral plates basally, with dense, long, erect, yellow pubescence apically; Aedeagus rather stout, the outer face with elongate subapical cavity showing paired elongate projections; apical shaft part slightly lengthened; fringed plates near thecal apex suberect.

Body length 15 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Habitus: slightly stouter than males. Head: Midstripe on frons occupying 1/3 of width, noticeably tapering posteriorly. Thorax: Longitudinal bands slightly clearer; less lustrous on sides. Abdomen: T II hardly tapering; pruinose bands wider, less arcuate, strongly marked; apart from the quite different colour, not unlike those in *femoratus*.

Body length 15-16 mm.

Diagnosis. – The males of *mariae* can be distinguished from those of other species by their possessing accessory lobes on both anterior and posterior surstyle lobe and robust habitus with typical dark yellow to orange abdominal pubescence. The females are stout and show a very sharply defined pattern of pruinose bands on the abdomen; they are unlikely to be confused with other species.

Period of flight and distribution (fig. 105). – *M. mariae* is apparently common on Corsica and is known also from Sardinia, Sicily and Greece. This distribution pattern is not known from other *Merodon*. The flight period is from May through October, probably in more than one generation.

Etymology. – It is a pleasure to dedicate this species

to my wife, Marijke Wester, to commemorate her support and stimulation of my work. A noun in genitive case.

Merodon ottomanus sp. n.

(figs. 26 a-c, 106)

Type-material. – ♂ Holotype 'Turkey, Hakkari, Tanin-Tanin pass 2200 m, 12.vi.1984 leg. J. A. W. Lucas' (ZMAN). Paratypes: 7♂, 3♀, all with same data as holotype (JLR).

Description

Male. – Head: Antennae orange, antenna 3 with upper margin straight, apex subacute, antennal ratio 1.7; vertex angle 50°, ocellar angle 65°; pubescence long, pale ochre yellow, moderately dense, with dark tuft in ocellar region; pubescence on compound eyes pale yellow to white, moderately dense, conspicuously long; tl-v ratio 0.5.

Thorax: Dark, faintly blue metallic lustrous to naked eye, under magnification showing very strong lustre partially dulled by disperse whitish pruinosity, the lustre strongest on katepisternum, anepisternum and anepimeron; pubescence as on face but longer still. Wings slightly yellow tinged, halteres, squamae and antisquamae yellow to pale yellow.

Legs: All femora dark with yellow apices, tibiae yellow with wide dark distal band, tarsi yellow; trochanter 3 smooth, femora 3 slender, triangular process low and bearing 4-6 bristles on serrate distal margin.

Abdomen: Slender; dark; bluish metallic lustrous laterally on T II, there showing dense pubescence, otherwise pubescence moderately dense, pale yellow, and conspicuously long; T III with vestigial narrow arcuate pruinose band in some specimens; S IV strongly vaulted, posteriorly hardly emarginate, partially hidden by curved sides of T IV and its pubescence.

Genitalia: Anterior surstyle lobe strongly yellow, short even pubescent, somewhat angular, coalescent with the short posterior surstyle lobe bearing long pubescence posteriorly. Cercus quadrate, with long dense yellow pubescence. Aedeagus with apical shaft part lengthened, fringed plates on thecal apex recumbent, aedeagus subapically constricted in lateral view.

Body length 9 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: ocellar angle 70°, frons lustrous, diffusely pruinose laterally. Thorax: Less lustrous. Abdomen: Pubescence slightly less dense and long, but still most conspicuous.

Body length 9 mm.

Diagnosis. – Apart from differences in the male genitalia, *ottomanus* can be distinguished from other

species by the long, pale erect pubescence of all exposed parts of the body; viewed with the naked eye this pubescence produces a hazy fringe around the insect.

Period of flight and distribution (fig. 106). – The species occurs in south-eastern Turkey where it flies in June.

Etymology. – The name *ottomanus* (an adjective) refers to the former Ottoman empire and was chosen to indicate the region of occurrence of the species, viz. Turkey.

Merodon testaceoides sp. n.
(figs. 27 a-c, 105)

Type-material. – ♂ Holotype 'Yugoslavia, 30 km ZW Gradsko, 41. 26' N, 21. 50' E, 13.viii.1963 exc. Leiden' (RMNH). – Paratypes: 1♂ (ZMAN), 1♀ (RMNH), 2♀ (JLR), same data as holotype.

Description

Male. – Head: Antennae dark, antenna 3 with upper margin slightly convex, apex obtuse, antennal ratio 1.5; vertex angle 25°; ocellar angle 40°; pubescence pale yellow; tl-v ratio 0.5.

Thorax: Dark, rather lustrous on katapisternum, anepisternum, anepimeron, lateral scutellum and dorsum; pubescence moderately dense, pale yellow; dorsum showing inconspicuous pruinose bands. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: All femora dark with yellow apices, tibiae yellow with broad dark distal band, tarsi yellow to red; trochanter 3 with low ridge; femora 3 swollen, curved, bearing normally shaped triangular process with 8 bristles on slightly serrate distal margin, widest spaced basally.

Abdomen: Slender; conspicuously orange, T II tapering considerably, with dark anterior lunule in some specimens; T II-IV with arcuate pruinose bands, interrupted on T II-III; pubescence pale throughout, some dark pubescence often present on dark anterior lunule of T II; S IV orange, strongly vaulted, incised up to 2/3 its length from posterior margin.

Genitalia: Anterior surstyle lobe low, rounded-elongate, with short, dense, even, yellow pubescence throughout, separate from posterior surstyle lobe by moderately deep and wide sulcus; posterior surstyle lobe rounded, rather low, bearing moderately dense, erect, yellow pubescence throughout, slightly denser apically. Cercus rounded, rather small, bearing dense yellow pubescence. Aedeagus showing paired humps basally on outer face, and marked subapical cavity; ap-

ical shaft part slightly lengthened, fringed plates on thecal apex recumbent to somewhat suberect.

Body length 10-12 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Lustrous midstripe occupying 1/3 of frons, ocellar angle 50°. Abdomen: pale reddish to yellow throughout, T II less tapering.

Body length 10-12 mm.

Diagnosis. – The relatively small size and striking orange abdomen in both sexes precludes confusion with all but a few species. *M. testaceoides* is similar externally to *testaceus* from which it is distinguished in the males by the very different genitalia; the females of *testaceoides* can best be distinguished by the paler colour of the abdomen and longer, denser abdominal pubescence. Both sexes differ from the species of the *longicornis* group by the all red to orange abdomen, which in that species group is partially crimson, partially black; moreover, the antennal ratio is less in *testaceoides*.

Period of flight and distribution (fig. 105). – This species is known only from Macedonia, where it was collected in August.

Etymology. – The epitheton *testaceoides* refers to *Merodon testaceus* to which this species is externally similar; the suffix -ides means 'in likeness of'. An adjective.

The *alexexi* group

Apomorphies: Anterior surstyle lobe elongate; posterior surstyle lobe high to very high, curving medially.

Description. – Head: Antennae dark, 3rd article red or orange in some species, antennal ratio 1.5 to 2.4; eyes with touchline incomplete to equalling 0.15-0.9 vertex height; pubescence golden to pale yellow with more or less conspicuous dark tuft in ocellar region. vertex angle and ocellar angle variable, oral margin well defined.

Thorax: Dark with some lustre and in some species with traces of longitudinal pruinose bands; wings mostly clear, veins brown, paler in *rufitarsis* and *sophron*; halteres, squamae and antisquamae yellow.

Legs: All dark or with yellow markings on tibiae and tarsi; trochanters 3 smooth, with faint (*hypochrysos*) or strong (*marginicornis*, *rufitarsis*) edge or knob; femora 3 mostly rather swollen, straight; basitarsi 3 somewhat swollen in *marginicornis*.

Abdomen: Rather slender; T II moderately tapering, with slightly to more strongly arcuate pruinose bands of variable clarity; lateral spots yellow to

orange, or bluish, or lacking; S IV normal.

Genitalia: The anterior surstyle lobe elongate to extremely elongate, bearing short, dense pubescence at least apically, separated from the posterior surstyle lobe by a shallow sulcus, or coalescent; the posterior surstyle lobes much extended medially, often overlapping, hiding part of the aedeagus from view. Aedeagus smooth on outer face, mostly slender, apical shaft part slightly lengthened, subapical cavity well defined.

Merodon alexeji Paramonov

(figs. 28 a, b, 29 a, 81)

Merodon alexeji Paramonov, 1925: 155. Holotype ♂ (and ♀ paratype) 'Kechanowka, Balta, Odessa, Ukraine, U. S. S. R., 1.vi.1924, leg. A. Paramonov' [not examined, presumably lost].

Merodon alexeji; Paramonov 1935: 164, 166; Liepa 1969: 20; Van der Goot 1981: 215, 218; Violovitsh 1983: 124; Peck 1988: 167.

Lampetia alexeji; Sack 1931: 304.

Material examined. – Algeria: 2♂ (ZMAN, WH); France: 5♂, 4♀ (MNHN, KBIN, ZMAN); Greece: 5♂, 4♀ (BMNH, KBIN, ZMUC, NHMW); Italy: 1♂ (NHMW); Mongolia: 1♀ (TMA); Morocco: 6♂, 1♀ (MNHN); Spain: 2♂ (ZMAN, WH); Tunisia: 2♂ (JLR); U. S. S. R.: 5♂, 3♀ [1♂ identified by original author, in KBIN] (BMNH, KBIN, ZMHB, H. Hippa, Helsinki).

Description

Male. – Head: Antenna dark brown, antenna 3 tapering, upper margin rather straight, apex subacute, antennal ratio 2.1; pubescence whitish to pale yellow, rather sparse with dark tuft in ocellar region; vertex angle 40°, ocellar angle 50°, ocelli rather large; tl-v ratio 0.45; pubescence on eyes pale, inconspicuous.

Thorax: Dark; katapisternum, anepisternum, anepimeron, dorsum and scutellum metallic lustrous, with short moderately dense, erect, uneven yellow pubescence, with variably clear interalar band; in some specimens vague pruinose bands present. Wings clear, brown veined; halteres, squamae and antisquamae yellow.

Legs: All dark; trochanters 3 smooth, femora 3 rather swollen, with normal triangular processus bearing 6-12 bristles, basitarsi 3 and other tarsi 3 normal, tibiae 3 rather slender.

Abdomen: Rather slender, with tapering T II, somewhat triangular, dark with slight metallic lustre overall (strongest laterally), bearing dark orange lateral spots on T II; T II-IV with rather narrow, arcuate, interrupted whitish pruinose bands, pubescence pale, inconspicuous medially.

Genitalia: The anterior surstyle lobe much elongate, slightly spatulate, with short, even, dense, erect, yellow pubescence apically and along dorsal

margin; separated from posterior surstyle lobe by a sulcus; posterior surstyle lobe divided into basal and apical parts by a suture, anteriorly with smooth knob; apical part mediolaterally aligned, rather high, these parts on both sides overlapping; posterior surstyle lobe with rather dense, yellowish, erect pubescence but sparser on apical margin. Cercus conspicuous, rectangular, with dense, long, uneven, yellow pubescence. Aedeagus rather slender, smooth on outer face, apical shaft part slightly lengthened, fringed plates on thecal apex oblique to recumbent.

Body length 9-11 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Ocellar region with darker pubescence; ocellar angle = 60°; lustrous mid-stripe on frons occupies all but fringes. Thorax: Pruinoso bands clearer, less lustrous. Legs: The femora 3 rather variable in the degree of swelling. Abdomen: Triangular, pruinose bands wider, lateral spots variable, not always clear. T V acute, almost bald, mostly inconspicuous.

Body length 9-11 mm.

Variation. – Especially in the males *M. alexeji* is variable in the clearness of the abdominal lateral spots, the number of bristles on the triangular processus, and slightly so in the elongation of the knob on the posterior surstyle lobe and the position (not the shape) of the cercus.

Diagnosis. – *M. alexeji* can be separated from other species in the *alexeji* group by the presence of both the knob on the posterior surstyle lobe and the rectangular well protruding cercus. The latter feature separates from *altinosus* (cercus inconspicuous) and *sophron* (cercus short, very wide) which also have the posterior surstyle lobe knob. *alexeji* is separated from *altinosus* by the lack of dense abdominal pubescence as well.

Period of flight and distribution (fig. 81). – The imagines occur from May in the Mediterranean to July in the northern parts of the range, which includes the mediterranean countries and the temperate parts of western and central Eurasia.

Discussion. – Although type-material of this species was not available there is no doubt about the identity of *alexeji*. The original description mentions a number of diagnostic characters; moreover material examined and identified by S. J. Paramonov has been examined.

Merodon altinosus sp. n.
(fig. 29 b, 102)

Type-material. – ♂ Holotype "Turkey, Hakkari, Suvarihalil pass 1250 m., W. side near Habul Deresi [37° 35' N, 43° 20' E], 13.vi.1984, leg. Lucas' (ZMAN).

Description

Male. – Head: Antennae blackish, antenna 3 with upper margin slightly concave, apex subacute, antennal ratio 2.4, pubescence golden, a dark tuft present in ocellar region; vertex angle 30°, ocellar angle 45°, tl-v ratio 0.6.

Thorax: Dark, slightly metallic lustrous on katapisternum, anepisternum, anepimeron, dorsum and scutellum, with moderately dense, longish, uneven, golden pubescence, without pruinose bands. Wings slightly troubled evenly, especially basally and on anterior margin; halteres, squamae and antisquamae yellow.

Legs: All dark; trochanters 3 smooth, femora 3 swollen, rather straight, bearing normal triangular processus with strong apical spur and 8 extremely short stout bristles; tibiae 3 and tarsi 3 normal.

Abdomen: Dark, tapering posteriorly; T II with yellow lateral spots; dense, golden, oblique pubescence present throughout; vestigial arcuate pruinose bands present on T II-IV, clearest on T III.

Genitalia: The anterior surstyle lobe elongate, anteriorly with dense, short, even, yellow pubescence, coalescent with posterior surstyle lobe; that lobe mediolaterally aligned in its apical part, overlapping; an elongate smooth knob present anteriorly on the posterior surstyle lobe; posterior part with long, rather dense, erect, uneven, yellow pubescence. Cercus moderately large, not far protruding, bearing dense, erect, long, yellow pubescence. Aedeagus rather slender, smooth on outer face, fringed plates on thecal apex suberect.

Body length 9.5 mm.

Female. – Unknown.

Diagnosis. – *M. altinosus* resembles *alexexi* from which it is separated by the conspicuous golden pubescence on the abdomen, the extremely short bristles on the triangular processus with its strong apical spur and the less protruding cercus; it is distinguished from *sophron* by the same features, and from other species in the *alexexi* group by the presence of a knob on the posterior surstyle lobe.

Period of flight and distribution (fig. 102). – The species is known from the holotype only, collected in eastern Turkey in June.

Etymology. – The name *altinosus* (an adjective) de-

notes the golden habitus of the species, and is derived from the Turkish *altun*, meaning gold, and the Latin suffix -osus, meaning full of.

Merodon hirsutus Sack
(figs. 30 a-c, 82)

Merodon hirsutus Sack, 1913a: 435. Lectotype ♂ (here designated): 'Djebel Akra [35° 35' N, 36° 15' E] vi.85 [1885], N. Syria, Dr. E. Leuthner/ *Lampetia hirsuta* Sack det. Sack' (NHMW) [examined].

Merodon hirsutus, Peck 1988: 171.

Lampetia hirsuta, Sack 1931: 318; Séguy 1941: 14.

Material examined. – Israel: 3 ♀ (BMNH, RMNH); Jordan: 2 ♀ (RMNH); Syria: 9 ♂ Paralectotypes, with same data as lectotype (NHMW, ZMAN) [examined]; 1 ♀ Paralectotype, 'Syria/ *hirsutus* Sack/ coll. J. Villeneuve: *Lampetia hirsuta* Sack RMHN Belg. 15.392' (KBIN); Turkey: 2 ♀ (BMNH).

Description

Male. – Head: Antennae blackish, antenna 3 with straight upper margin, apex acute, antennal ratio 1.9; pubescence yellow, dark tuft in ocellar region weak; vertex angle 40°, ocellar angle 50°, tl-v ratio 0.9; pubescence on eyes inconspicuous.

Thorax: Dark, slightly metallic lustrous on katapisternum, anepisternum, anepimeron, dorsum and scutellum; pubescence dense, erect, uneven, yellow, moderately long. Wings clear, brown veined; halteres, squamae and antisquamae yellow.

Legs: Dark with yellow markings on both ends of tibiae, rather slender; bearing normal triangular processus with short stout bristles, tibiae 3 and tarsi 3 normally shaped.

Abdomen: Dark, rather slender to somewhat stout, lacking strong lustre (not due to surface sculpturing); laterally slight micaceous lustre present; T II-IV with slightly arcuate, moderately wide whitish interrupted pruinose bands; pubescence rather long, yellowish, densest laterally, dark and sparser on posteromedian parts of T III-IV; sternites dark, with scattered whitish pubescence; S IV slightly vaulted.

Genitalia: Anterior surstyle lobe extremely elongate, anteriorly rather rectangular, bearing dense, short, yellow pubescence, slightly spatulate, separated from posterior surstyle lobe by shallow but clear sulcus; posterior surstyle lobe rounded, showing uneven, long, dense, yellow pubescence especially posteriorly. Cercus conspicuously protruding, with dense, long, yellow pubescence. Aedeagus smooth on outer face, stout basally, slender apically, apical shaft part slightly lengthened, fringed plates on thecal apex suberect.

Body length 10 mm.

Female. – Except for sexual dimorphism, differing

from the male as follows. Head: Ocellar angle 55°, shining midstripe on frons occupies 0.6 of width. Thorax: Pubescence comparatively shorter, more even. Legs: femoral apices very narrowly brownish. Abdomen: Slightly more slender; pruinose band on T II reduced; those on T III-IV clearer, wider, nearly continuous, more arcuate.

Body length 9.5-10.5 mm.

Variation. – There is little variation in the males (all specimens examined are from same locality); the females show slight size variation.

Diagnosis. – *Merodon hirsutus* is externally similar to *M. hirtus* Sack from which it is easily distinguished by its very different genitalia; study of the genitalia is essential since both species fly together in the same region. From the other species of the *alexexi* group, *hirsutus* can be separated by the extremely long anterior surstyle lobe, the relatively low posterior surstyle lobe and lack of yellow lateral spots on T II.

Period of flight and distribution (fig. 82). – *M. hirsutus* occurs in the eastern Mediterranean region from March through June.

Merodon hypochrysos sp. n.
(figs. 31 a-c, 82)

Type-material. – ♂ Holotype 'Turkey, Adiyaman, 10 kms. North of Celikhan, Altı Haral Gölü [38° 05' N, 38° 22' E], 1450 m, 1.vii.1986, leg. Lucas' (ZMAN). Paratypes: 20♂ 'Turkey, Hakkari, Sat Dagları, Vargös [37° 25' N, 43° 55' E] 1600-1650 m, 15/18.vi.1984, leg. Lucas' (JLR).

Description

Male. – Head: antennae dark, antenna 3 red, upper margin convex, apex rounded, antennal ratio 1.5, vertex angle 40°, ocellar angle 45°, tl-v ratio 0.2; pubescence pale yellow, with dark tuft in ocellar region.

Thorax: Black, lustrous on katapisternum, anepisternum, anepimeron, dorsum and scutellum; pubescence rather sparse, golden, paler down sides and on scutellum, rather even. Wings slightly tinged, veins brown, halteres, squamae and antisquamae pale yellow.

Legs: Dark, apices of femora and bases of tibiae paler; trochanters 3 with inconspicuous edge; femora 3 much swollen, straight, bearing normal triangular process with weakly serrate distal margin holding 5-8 small bristles; tibiae 3 long, slender, bearing small apical spur distally on medial face; tarsi 3 normal, relatively small.

Abdomen: Dark, golden metallic lustrous with bluish to bronze reflections on sides; T III-IV with moderately arcuate, whitish to pale yellow, interrupt-

ed, moderately wide pruinose bands; pubescence pale golden, densest laterally.

Genitalia: Anterior surstyle lobe elongate, slightly diamond-shaped, apically with short, even, dense, yellow pubescence, posterior surstyle lobe more or less coalescent but steeply rising, rather rounded, slightly mediolaterally aligned apically; posterior portion showing dense, erect, yellow pubescence. Cercus well protruding, moderately large, rounded, bearing dense yellow pubescence. Aedeagus basally stout, tapering, subapical cavity elongate and showing conspicuous paired chitinous plates; an accessory triangular cavity present just below the recumbent fringed plates on the thecal apex (which acutely protrudes well beyond the plates).

Body length 7 mm.

Female. – Unknown.

Diagnosis. – *M. hypochrysos* can be distinguished from other species in the *alexexi* group by its golden surface and pubescence of the abdomen; the lack of a knob on the posterior surstyle lobe distinguishes from the larger but superficially similar *altinosus*.

Period of flight and distribution (fig. 82). – This species is known from the mountains of eastern Turkey where it occurs in June and July.

Etymology. – The epitheton is derived from the Greek words hypo, i.e. under, less than, and chrysos, meaning gold, on account of the moderate golden lustre of the male. An adjective.

Merodon kawamurae Matsumura
(figs. 32 a-c, 79)

Merodon kawamurae Matsumura, 1916: 257. Described after an unknown number of specimens from Kumamoto, Kyushu, Japan, leg. Kawamura. [not examined].

Lampetia micromegas Hervé Bazin, 1929: 111. Lectotype ♂ (here designated): 'T'chen-Kiang, 13.iv.1918/ *Lampetia micromegas* H. B. type' [examined] (MNHN). Syn. n.

Merodon kawamurae, Paramonov 1925: 160; Shiraki 1930: 206.

Lampetia kawamurae, Hervé Bazin 1929: 111; Sack 1931: 319.

Merodon kawamurae, Shiraki 1968: 198; Peck 1988: 171.

Merodon micromegas, Peck 1988: 172.

Material examined. – China: Paralectotypes of *micromegas*: 19♂, 39♀: Topotypic 9♂, 18♀ (MNHN); 'Shia-Shu' 6♀ (MNHN, BMNH); 'Che-Mo' 9♂, 10♀ (MNHN, BMNH); 'Nanking' 3♀ (MNHN, BMNH); 'Hua-Chan' 1♂, 2♀ (MNHN), Collection dates from 1.iv.1918 to 16.v.1918. – Non types: China: 1♀ (NHMW); Japan: 2♂, 1♀ (BMNH).

Description

Male. – Head: Antennae orange, antenna 3 with upper margin convex, apex acute to rounded, most variable, antennal ratio 1.6; vertex angle 35°, ocellar angle 50°, tl-v ratio 0.15 to 0.3; vertex sides straight to slightly concave; pubescence pale yellow, with dark tuft in ocellar region.

Thorax: Metallic lustrous on katapisternum, anepisternum, anepimeron, dorsum and scutellum, bearing moderately dense and long, uneven, yellow to white pubescence. Wings slightly tinged, halteres, squamae and antisquamae yellow; very faint longitudinal striation present in some specimens.

Legs: All femora dark brown, tibiae yellowish with broad dark band in distal half (in some specimens more extended), tarsi, especially tarsi 3 dark above, with golden pubescence underneath; trochanters 3 smooth to distinctly edged (seen as little spine in end-on view), femora 3 rather swollen, with normal triangular process bearing 12-15 spinules of which the apical 1-3 are robust, the others rather fine; tibiae 3 and tarsi 3 normal.

Abdomen: Dark; T II-IV bearing widely to hardly interrupted, slightly arcuate, white, laterally widening pruinose bands; T II with rather large orange lateral spots, dark-centred in some specimens; pubescence inconspicuous, pale yellow to white, densest laterally on T II-IV and abdominal tip; S IV weakly vaulted, posterior margin entire to shallowly emarginate.

Genitalia: The anterior surstyle lobe rather large, slightly spatulate, elongate, rounded, apically with dense, short, even, yellow pubescence; posterior surstyle lobe coalescent, strongly mediolaterally aligned, overlapping, posteriorly with dense, erect, yellow pubescence. Cercus wide and short, bearing dense, erect, long, yellow pubescence. Aedeagus smooth on outer face, apical shaft part short, fringed plates on thecal apex large, suberect to erect.

Body length 7-11.5 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Antenna 3 generally less acute than in males; ocellar angle 60°; frons strongly golden lustrous throughout, diffusely pruinose on margins, showing white pubescence; vertex slightly but clearly edged anteriorly in some specimens. Thorax: Clearly more lustrous; pubescence less dense; traces of striation clearer. Legs: Often relatively more yellow, especially on tibiae. Abdomen: Slenderer, lateral spots larger.

Body length 6-12 mm.

Variation. – *M. kawamurae* is one of the most variable species in *Merodon*. The variation observed seems to be size-correlated: the largest specimens show the strongest lustre, the most acute antenna 3,

most edged trochanters 3 and most vaulted and emarginate S IV (males), or strongest edged vertex (females). In view of this variability, including size variation of 100%, more than one species would seem to be involved. There are however several strong arguments for considering all material conspecific: 1. there are gradual transitions in all variable features; 2. all males are completely similar in the genitalia; 3. many cases of such extreme variation are known in other insect species, some of which have been shown to be the direct effect of food availability.

Diagnosis. – *M. kawamurae* can be distinguished by its clearly spatulate anterior surstyle lobe in the males and by the golden lustrous vertex, slender abdomen and (some specimens) the edge on the vertex. Moreover it is the only small-sized *Merodon* species currently known from China and Japan, the only larger-sized species being *equestris* Fabricius. Of other *Merodon* species the only one possibly occurring in this region is *alexeji* which has a much longer anterior surstyle lobe and more protruding cercus (fig. 28 a). *M. alexeji* has been found in Mongolia but more eastward localities are unknown.

Period of flight and distribution (fig. 79). – *M. kawamurae* is known from eastern China and Japan, and occurs in April and May.

Discussion. – The synonymy of *M. micromegas* with *M. kawamurae* might be questioned since no type-material of *M. kawamurae* has been examined. After Horn and Kahle (1936) the Matsumura types might be at the Agricultural Department of Hokkaido University, Sapporo, Japan, but inquiries there have not confirmed the presence of the *kawamurae* types at this institute. The illustrations and descriptions of *kawamurae* and *micromegas* leave hardly any doubt as to their conspecificity; moreover, Hervé-Bazin himself already stated that *micromegas* might be conspecific with *kawamurae* and described *micromegas* since he 'thought the description of *kawamurae* as given by Matsumura (1916) insufficient' (Hervé-Bazin 1929). The Japanese material currently known is in the BMNH.

Merodon marginicornis sp. n.
(figs. 33 a-c, 82)

Type-material. – ♂ Holotype 'Iran, Chiraz [26° 40' N, 52° 30' E], 11.iv.1937, Coll. F. H. Brandt' (RMNH).

Description

Male. – Head: antennae large, antenna 3 orange, apex acute, upper margin edged, concave, antennal

ratio 2.4; vertex angle 35°, ocellar angle 65°, tl-v ratio 0.4, pubescence pale yellow.

Thorax: Dark; katepisternum, anepisternum, anepimeron, dorsum and scutellum bronze lustrous; pubescence rather sparse, short, uneven, pale yellow; no traces of pruinose bands present. Wings slightly tinged, brown veined; halteres, squamae and antisquamae pale yellow.

Legs: Dark, but tarsi brownish orange; trochanters 3 with distinct knob; femora 3 swollen, rather straight, with low, strongly serrate triangular process bearing 8 spinules; tibiae normal, basitarsi 3 slightly swollen, other tarsi 3 normal.

Abdomen: Dark, vaguely bluish lustrous, with rather vaguely bordered but well marked, slightly arcuate, interrupted whitish pruinose bands on T II-IV; T II bearing strongly lustrous bluish lateral spots; pubescence rather sparse, whitish, densest antero-laterally; S IV deeply emarginate posteriorly, somewhat vaulted.

Genitalia: Anterior surstyle lobe elongate, bearing short, even, yellow, erect pubescence dorsally and along margins, showing elongate bald area, bordered by a rim, on lateral face; the posterior surstyle lobe separated by a shallow sulcus, elongate, posteriorly with yellow, dense, erect pubescence. Cercus inconspicuous, with long, dense, yellow pubescence. Aedeagus smooth on outer face, with long subapical cavity, showing paired elongate, heavily sclerotized structures basally; fringed plates suberect, apical shaft part short.

Body length 9 mm.

Female. – Unknown.

Diagnosis. – *M. marginicornis* can be easily distinguished by the bald, rimmed area on the lateral face of the anterior surstyle lobe.

Period of flight and distribution (fig. 82). – *M. marginicornis* is known only from the holotype, collected in south-western Iran in April.

Discussion. – *M. marginicornis* has been assigned to the *alexexi* group in view of the structure of its male genitalia; it has somewhat swollen basitarsi 3 [a synapomorphy for the *tarsatus* group], but lacks the modification of S IV [the other synapomorphy for the *tarsatus* group]. Therefore this species may in fact occupy a position in between these two groups.

Etymology. – The epitheton *marginicornis* refers to the edged upper margin of the antenna 3; it is derived from the latin *margo*, meaning edge, and *cornu*, meaning horn, in insects often used in referring to antennae. A noun in apposition.

Merodon rufitarsis Sack stat. n.

(figs. 34 a-c, 83)

Merodon fulcratus Sack, 1913, subsp. *rufitarsis* Sack, 1913a: 438. Holotype ♂: 'Alai mont' [the Alajsski Mountains, Tadzhikistan, approx. 39° 30' N, 71° to 73° E] (ZMHB) [examined].

Merodon (Exmerodon) fulcratus ssp. *rufitarsis*, Peck 1988: 165.

Description

Male. – Head: Antennae dark, antenna 3 red, apex rounded, upper margin convex, antennal ratio 1.6; vertex angle 30°, ocellar angle 50°, pubescence pale yellow; touchline incomplete, tl-v ratio 0.15; compound eyes with inconspicuous white pubescence.

Thorax: Dark; katepisternum, anepisternum, anepimeron, dorsum and scutellum slightly lustrous, bearing moderately long and dense, yellow, rather uneven pubescence, without traces of pruinose bands. Wings clear, veins pale brown, halteres, squamae and antisquamae pale yellow.

Legs: All femora dark, tibiae orange with wide dark distal band, tarsi orange; trochanters 3 with low sharp edge, femora 3 moderately swollen, rather straight, bearing normal triangular process with 10 spinules; tibiae 3 and tarsi 3 normal.

Abdomen: Dark, without lateral spots or pruinose bands; pubescence rather dense, uneven, yellow, suberect; S IV strongly keeled; abdominal surface slightly lustrous throughout, strongest laterally.

Genitalia: Anterior surstyle lobe much elongate, with short yellow even pubescence apically and down margins; posterior surstyle lobe separated by shallow sulcus, large, strongly mediolaterally aligned, showing rather long, yellow pubescence apically and posteriorly. Cercus rather short, wide, with dense, long, yellow pubescence. Aedeagus smooth on outer face, with paired chitinous plates in middle region of shaft; apical shaft part rather short, subapical cavity well marked, fringed plates on thecal apex suberect.

Body length 9 mm.

Female. – Unknown.

Diagnosis. – *M. rufitarsis* can be distinguished by the combination of lacking abdominal bands and lateral spots with the mediolaterally aligned posterior surstyle lobe.

Period of flight and distribution (fig. 83). – *M. rufitarsis* is known from Tadzhikistan; the flight period is unknown.

Discussion. – *M. rufitarsis* cannot be considered a subspecies of *M. fulcratus* Becker as originally established by Sack (1913a). From their respective descrip-

tions it is clear that Becker and Sack described two different species, although both were based on information provided by Loew. Type material belonging to the nominate form of *M. fulcratus* Sack has not been recovered. *Merodon fulcratus* Sack, 1913 (published August, 1913) is a junior homonym of *Merodon fulcratus* Becker, 1913 (published April, 1913), and should be renamed when its identity has become clear. The male genitalia are very different. For instance, in *M. fulcratus* Becker the aedeagus is abruptly tapering basally and the surstyle lobes are smaller. *M. ruftarsis* has completely touching eyes in the male, whereas in males of *fulcratus* Becker the eyes are widely separated. These species are assigned to different species groups, and are not considered closely related.

Merodon sophron sp. n.
(figs. 35 a-c, 81)

Type-material. – ♂ Holotype 'Morocco, Azrou [33° 25' N, 05° 20' W], 29.v.1925, E. Hartert' (BMNH).

Description

Male. – Head: Antennae dark, antenna 3 with slightly convex upper margin, apex acute, antennal ratio 2.0; vertex angle 30°, ocellar angle 60°, tl-v ratio 0.6; pubescence pale yellow, with dark tuft in ocellar region.

Thorax: Dark, katapisternum, anepisternum and anepimeron lustrous; pubescence greyish yellow, slightly uneven; no pruinose bands present. Wings clear, orange veined; halteres, squamae and antisquamae pale orange.

Legs: All dark; trochanters 3 smooth; femora 3 swollen, with normal triangular process bearing 6 bristles; tibiae 3 and tarsi 3 normal.

Abdomen: Dark, comparatively stout; T II-IV with slightly arcuate, narrow, widely interrupted whitish pruinose bands and slight metallic lustre overall; T II with clear metallic lustrous lateral spots bearing rather dense, golden pubescence; pubescence otherwise paler, less conspicuous.

Genitalia: Anterior surstyle lobe elongate, rectangular, markedly curving dorso-anteriorly, spatulate, with dense, yellow, even pubescence apically; posterior surstyle lobe separated by small clear sulcus, rather large, very high, apical parts mediolaterally aligned and largely overlapping; the posterior surstyle lobe bears a bald, slightly elongate knob anteriorly; from here a suture runs toward the posterior margin, dividing the posterior surstyle lobe in basal and apical parts; the posterior margin bears dense, long, erect, yellow pubescence. Cercus very large with same pubescence. Aedeagus smooth on outer face, excavated on this face in hardly lengthened apical shaft part;

fringed plates on thecal apex rather large, erect; in natural position aedeagus entirely covered by posterior surstyle lobe.

Body length 9.5 mm.

Female. – Unknown.

Diagnosis. – *M. sophron* is distinguished from other species by its very large overlapping posterior surstyle lobe and its golden pubescence on the metallic lustrous lateral spots on T II.

Period of flight and distribution (fig. 81). – *M. sophron* is known only from the holotype, collected in Morocco in May.

Etymology. – The epitheton *sophron* is derived from the greek words *soos*, meaning chaste, and *phronein*, meaning to act, and refers to the 'chaste' covering of the aedeagus in this species. A noun in apposition.

Merodon tener Sack
(fig. 81)

Merodon tener Sack, 1913a: 443. Lectotype ♀ (here designated): 'Sarepta [= Krasnoarmeysk near Volgograd, after Peck 1988]/ *M. tener* Sack det. Sack/ coll. Lichtwardt/ coll. D. E. I. Eberswalde' [examined].

Merodon tener; Becker 1921: 54; Van der Goot 1981: 215. *Lampetia tenera*; Sack 1931: 329.

Material examined. – ♀ Paralectotype with same data as lectotype (DEIC).

Description

The lectotype and paralectotype are quite similar to *alexexi* females. The main differences are: ocellar angle 70° in the *tener* types, 60° in *alexexi*; coloration of abdomen reddish throughout in *tener* and slightly stouter than in *alexexi*. Lectotype and paralectotype differ slightly in the degree of swelling of the femora 3 but are otherwise similar among themselves and to *alexexi*.

Period of flight and distribution (fig. 81). – *M. tener* is known from the southern and eastern parts of Russia, where it has been collected in June (Sack 1931: 329).

Discussion. – Since no male type-material of *tener* has been traced it is impossible to ascertain the status of *tener* as a separate species. In view of the differences stated *tener* is here considered to be a separate species. In view of the similarity in the females the species is tentatively assigned to the *alexexi* group.

Merodon trizonus (Szilady)

Lampetia trizona Szilady, 1940: 67. Syntypes ♂ and ♀: La Calle [el Kala], Algeria and Ain Draham, Tunisia [not examined].

Discussion. – The extremely brief description provided by Szilady is insufficient to separate *trizonus* from other *Merodon*. The original description expressly states that the species is related to *hirsutus* Sack. Therefore the species is tentatively assigned to the *alexexi* group which also includes *hirsutus*. The types of this species, formerly stored in TMA, have been lost in 1956 (Dr. A. Dély-Draskovits, in litt.). No other material assigned to this species is known.

The *tarsatus* group

Apomorphies: Basitarsus 3 strongly swollen, specialized pubescence present on inner face; S IV at least keeled, mostly strongly modified.

Description. – Head: Antennae orange to brown, antennal ratio 1.3 to 1.7, compound eyes in male usually touching with tl-v ratio 0.1 to 0.3, pubescence yellow to white, oral margin well marked. Thorax: Dark, metallic lustrous. Wings clear to slightly tinged, orange to dark veined, halteres, squamae and antisquamae yellow. Legs: Femora 3 with normally shaped triangular processus, tibiae 3 in male often bearing apical floccus inserted on distal spur, basitarsi 3 swollen strongly to enormously, less conspicuously so in females; showing short thick-set pubescence on inner face. Abdomen: Tergites metallic lustrous, S IV strongly modified in males of all species except *auronitens* and *caudatus* where it is only keeled. Genitalia: Anterior surstyle lobe simple, often with short, dense pubescence distally, separated by small suture from higher posterior surstyle lobe bearing long posterior pubescence. Cercus well protruding. Aedeagus with apical part short.

Merodon ankylogaster sp. n.

(figs. 36 a-b, 84)

Type-material. – ♂ Holotype 'Iran, Fars, Road Chiraz-Kazeroun, Ft. Sine-Sefid [Southwestern Iran, about 29° 35' N, 52° E, in mountains], 29.iv.1937, coll. F. H. Brandt' (RMNH). Paratype ♀, same data as holotype (RMNH).

Description

Male. – Head: Antennae orange, antenna 3 with upper margin convex, apex obtuse, antennal ratio 1.3; pubescence pale yellow, dark hairs present in ocellar region; vertex angle 40°, ocellar angle 45°, vertex large, tl-v ratio 0.15.

Thorax: Coppery lustrous on katepisternum, anepisternum, anepimeron, dorsum and scutellum, dor-

sal surface rather roughly sculptured, showing yellow, erect, uneven pubescence. Wings orange veined, clear.

Legs: Dark, tibiae basally yellow; tarsi with dense golden pubescence; trochanters 3 smooth, femora 3 much swollen, slightly metallic lustrous, with normal triangular processus; tibiae 3 without apical floccus; basitarsi 3 strongly swollen, bearing dense, golden, short pubescence medially; other tarsi 3 normally shaped.

Abdomen: T II much tapering posteriorly, without lateral spots; pruinose bands interrupted, slightly arcuate; pubescence moderately dense, golden, oblique; S IV with conspicuous median projection; abdominal surface roughly sculptured on medial region of all tergites.

Genitalia: The anterior surstyle lobe elongate, slightly spatulate, apically bearing short, dense, erect, yellow pubescence, posterior surstyle lobe separated from anterior surstyle lobe by shallow sulcus, steeply rising, posteriorly with long dense yellow pubescence. Cercus subangular, oblong, with similar pubescence. Aedeagus stout, with fringed plates on thecal apex recumbent, apical part screened by the apical portion of the posterior surstyle lobe in natural position.

Body length 7.5 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Ocellar angle 60°; frons lustrous throughout, laterally yellowish metallic lustrous. Thorax: Stoutier than in male; sculpturing less strong, pubescence more whitish. Abdomen: Stoutier, pruinose bands nearly continuous; pubescence whiter; S IV normal.

Body length 9 mm.

Diagnosis. – The male is unmistakable in view of the morphology of S IV; the female *ankylogaster* can be separated from *turkestanicus* by the partially orange legs, and from *caudatus* by the lack of lateral spots on the abdomen.

Period of flight and distribution (fig. 84). – The species is known only from the types, collected in Iran in April.

Discussion. – The shape of the anterior surstyle lobe and inward curve of the posterior surstyle lobe in *ankylogaster* suggest a certain degree of relationship with *alexexi* and its allies [note the discussion of *marginicornis* above]; in view of the modified S IV and the swollen basitarsi 3, *ankylogaster* has been assigned to the *tarsatus* group.

Etymology. – The epitheton *ankylogaster* is derived from the Greek ankylos, meaning spine, and gaster,

meaning belly, hence abdomen, and refers to the projection of S IV in the male of this species. The epitheton is to be treated as a noun in apposition.

Merodon auronitens sp. n.

(figs. 37 a-c, 84)

Type-material. – Holotype ♂ 'Israel, Mt. Carmel, Bat Slomo 32° 35' N, 35° 00' E, 22.iii.1981, W. B. M. Brantjes' (ZMAN). The antennae and the right leg 3 on cardboard tag, both anterior surstyle lobes attached to another cardboard tag.

Description

Male. – Head: Antennae black, 3rd article with upper margin concave, apex subacute, antennal ratio 1.7, vertex angle 35°, ocellar angle 40°, tl-v ratio 0.35; pubescence very dense, long, glossy golden on frons, slightly shorter and sparser on face and vertex.

Thorax: Dark; golden metallic lustrous laterally, bearing moderately dense, even, golden brown pubescence. Wings clear, halteres, squamae and antisquamae yellow.

Legs: Dark throughout, tibial bases and tarsi slightly lighter; trochanters 3 smooth, femora 3 much swollen, showing normally shaped triangular processus bearing 8 bristles; tibiae 3 show a clear, golden apical floccus; basitarsi 3 swollen, with very dense, short, golden pubescence on inner face.

Abdomen: T II slightly tapering, with traces of lateral spots; T II-IV with arcuate greyish pruinose bands, that on T II inconspicuous; pubescence rather long, even, yellow, moderately dense; sternite IV keeled, posteriorly slightly emarginate, but not deformed.

Genitalia: Anterior surstyle lobe somewhat elongate, with dense orangish pubescence throughout; connection to posterior lobe severed; posterior lobe rather high, curving medially apically, with scattered yellow pubescence on apical margin; posterior end with dense yellow pubescence. Cercus well protruding, bearing dense, long, yellow pubescence. Aedeagus smooth on outer face, fringed plates on thecal apex recumbent.

Body length 11.5 mm

Female. – Unknown.

Diagnosis. – *M. auronitens* can be distinguished from other species in this group by the lack of a deformed S IV, like *caudatus*, but differs from that species by not having a deformed genital cap.

Period of flight and distribution (fig. 84). – *M. auronitens* is known only from the holotype, collected in Israel in March.

Etymology. – The epitheton *auronitens* is latin, and derived from the word aurum, meaning, gold, and the verb nitere, meaning, to shine, the construction meaning, shining with gold, as a reference to the glossy pubescence on the head. The epitheton is to be treated as an adjective.

Merodon caudatus Sack

(figs. 38 a-d, 84)

Merodon caudatus Sack, 1913a: 446. Holotype: Asia Minor [Turkey] [not examined, considered lost].

Merodon caudatus; Paramonov 1926b: 322; Peck 1988: 168. *Lampetia caudata*; Sack 1931: 309.

Material examined. – Israel: 2♂, 1♀ 'Mt. Carmel, Beth Slomo, 22.3.1981 leg. Brantjes' (JLR); 1♀ 'Palestine, Beth Hakerem [near Jerusalem], 17.3.1951 leg. O. Theodor' (RMNH).

Description

Male. – Head: Antennae dark, antennal ratio 1.8, antenna 3 with apex obtuse, somewhat edged; vertex large, metallic lustrous, vertex angle 50°, ocellar angle 65°, pubescence yellow, whitish on face and occipital sides; compound eyes showing grey pubescence, tl-v ratio 0.2-0.25.

Thorax: Dark, brassy lustrous on katapisternum, anepisternum and anepimeron, dorsum and scutellum, showing dense, erect, yellowish, even pubescence, diffusely pruinose on lateral dorsum, scutellum and sides. Wings quite clear, halteres, squamae and antisquamae pale yellow.

Legs: All femora dark, apically paler, tibiae yellow with dark distal band, tarsi orange to brown, apical articles darkest; pubescence dense on tibiae and tarsi, yellow underneath; trochanters 3 smooth, femora 3 rather straight, triangular processus somewhat reduced, forming only slight knob; tibiae 3 curved and twisted, bearing apical floccus on drawn-out distal medial spur; basitarsi 3 short, swollen, with furrow giving twisted aspect, bearing short, even, dense, yellow pubescence; other tarsi 3 normal.

Abdomen: Tergites dark, metallic lustrous, T II with orange lateral spots and erect, orange pubescence (densest and longest on lateral spots); pruinose bands arcuate, interrupted on T III, continuous on T IV; S normal but S VIII (the genital cap) strongly modified, elongate, with apical floccus conspicuous to naked eye (hence the name *caudatus*).

Genitalia: The anterior and posterior surstyle lobes separated by deep wide sulcus; anterior surstyle lobe rounded-triangular, with short, even, dense, yellow pubescence, showing ridge running from ventro-posterior angle to mid region; posterior surstyle lobe short and high, with longish, uneven, yellow pubescence apically. Cercus well protruding, angular, with

very long, yellow pubescence. Aedeagus with short apical shaft part, the fringed plates on thecal apex recumbent.

Body length 12 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Ocellar angle 70° , frons metallic lustrous, diffusely pruinose on sides; frons clearly tapering toward vertex. Thorax: Markedly stouter than in male. Legs: Slenderer than in males, basitarsi 3 quite similarly modified but pubescence duller. Abdomen: Stouter, rather triangular, with conspicuous lateral spots bearing fiery orange hair-tufts; pruinose band on T III nearly continuous.

Body length 9.5 mm.

Diagnosis. – The males are easily separated by their unique genital cap; the females are similar to those of *ruficornis* Meigen and allied species from which they are separated by the swollen basitarsi 3.

Period of flight and distribution (fig. 84). – The species is known from Israel and Turkey where it occurs in March.

Discussion. – In spite of the fact that no type-material was available, the identification of this species is certain in view of the extraordinary features present. The assignment of the female of *caudatus* as presented here seems justified in view of the striking similarities (basitarsi 3, lateral spots on T II) and the concurrent flight in the same area.

Merodon oidipous sp. n.
(figs. 39 a-d, 84).

Type-material. – ♂ Holotype 'Turkey, Hakkari, Suvarihalil pass 2100 m, 4.vi.1984, leg. J. A. W. Lucas' (ZMAN). Paratypes: 2♂, same data as holotype (JLR).

Description

Male. – Head: Antennae orange to brown, antennae III paler than I-II, upper margin straight to slightly concave, apex rounded, antennal ratio 1.6; vertex angle = 40° , ocellar angle = 60° , rl-v ratio 0.25; face and occiput slightly, vertex strongly blue metallic lustrous; pubescence whitish to pale yellow, face more-over diffusely pruinose; compound eyes with greyish pubescence.

Thorax: Dark, with some steel blue lustre on lateral dorsum and scutellum, stronger on sides; pubescence erect, moderately dense, rather short, uneven. Wings clear; halteres with knob yellow, stalk darker, squamae and antisquamae yellow.

Legs: All femora dark with narrow yellow apices, tibiae yellow with broad dark distal band, tarsi dark

above, with dense pale pubescence underneath, upper faces orangeish to brown on legs 1-2, darker on 3; trochanter 3 bearing low projection with yellow hair-tuft; femur 3 swollen, bluish metallic lustrous; triangular processus rather large, with conspicuous apical spur, otherwise finely serrate, bearing some 9 bristles; tibiae 3 with long yellow apical floccus inserted on drawn-out distal inner angle; basitarsi 3 enormously swollen, almost globular, brownish, with dense golden short erect pubescence medially; other tarsi 3 normal.

Abdomen: Rather slender, dark; T II tapering posteriorly, T II-IV bearing slightly arcuate moderately wide interrupted pruinose bands; pubescence whitish, rather sparse, slightly denser laterally and on pruinose bands, darker medially; at certain angles vague metallic blue lustrous lateral spots on T II may be seen; S IV with paired, conspicuous appendages.

Genitalia: The anterior surstyle lobe somewhat spatulate, bearing dense, yellow, even, erect pubescence on distal margin; separated from the slightly elongate rounded posterior surstyle lobe by a shallow sulcus; posterior surstyle lobe incised dorsally, bearing dense, erect, yellow pubescence. Cercus conspicuous, elongate, with same pubescence. Aedeagus rather slender with short apical shaft part, fringed plates on thecal apex recumbent to suberect.

Body length 8.5 mm.

Female. – Unknown.

Diagnosis. – *M. oidipous* can be separated by its enormously swollen basitarsi 3 which are differently shaped than in other species of the *tarsatus* group, by the clear blue lustre on the vertex, and the more protruding cercus.

Period of flight and distribution (fig. 84). – The species, known only from the types, has been found in south-eastern Turkey in June.

Etymology. – The epitheton *oidipous* derives from the Greek and means, swollen foot. It refers to the enormously swollen basitarsi 3, conspicuous to the naked eye.

Merodon persicus sp. n.
(figs. 40 a-d, 85)

Type-material. – ♂ Holotype 'Iran, Fars, Ft. Sine-Sefid, Rd. Chiraz Kazeroun [29° 35' N, 52° E], Coll. F. H. Brandt 25.v.1937 / Lampetia smirnovi det. P. H. van Doesburg' (RMNH).

Description

Male. – Head: Antennae brown, antenna 3 orange,

upper margin straight to slightly concave, apex acute, antennal ratio 2.3; pubescence pale yellow, with dark hair-tuft in ocellar region; oral margin more protruding than in the other species in this group; face slightly diffusely pruinose; vertex angle 40°, ocellar angle 60°; tl-v ratio 0.25; compound eyes with whitish pubescence.

Thorax: Rather dull, surface dark brown, bearing uneven, short, erect yellow pubescence on dorsum, scutellum, katapisternum, anepisternum and anepimeron, with weak bronze lustre on these elements. Wings clear, halteres, squamae and antisquamae yellow.

Legs: Dark but bases of tibiae and tarsi brown; trochanter 3 showing well-defined low hump bearing rather short black bristly pubescence; femur 3 swollen, curved, with rather small triangular processus, strongly serrate on distal margin; tibiae 3 short, stout, with distinct apical floccus on distal medial angle; basitarsi 3 strongly swollen, showing dense, golden, short, erect pubescence throughout (densest on medial face). A slightly elevated, well defined area proximally on lower face bearing erect, dense dark bristly short pubescence obliterating the surface of this area; other tarsi 3 normal.

Abdomen: Moderately slender, all dark, with rather strong olivaceous metallic lustre; vaguely defined, arcuate pruinose bands present on T III-IV; pubescence golden throughout, some dark hairs present in posteromedian parts of T II-III. All S rectangular, S IV bearing conspicuous, paired appendages visible to naked eye.

Genitalia: The anterior surstyle lobe elongate, apical part widening and projecting dorsally, showing short, yellow, erect pubescence along ventral and distal margins; separated from posterior surstyle lobe by shallow suture, from which the rounded-rectangular posterior surstyle lobe steeply rises; posterior surstyle lobe with yellow, scattered, erect pubescence, longest on ventral and posterior margins. Cercus largish, bearing dense, long, yellow, erect pubescence. Aedeagus stout, fringed plates on thecal apex recumbent, apical shaft part short; in natural position the apical portion of the aedeagus is covered by the posterior surstyle lobe tops.

Body length 9.5 mm.

Female. – Unknown.

Diagnosis. – *M. persicus* seems to be most closely related to *tarsatus*, from which it differs in the smaller size, the entire basitarsi 3 with a small raised area (as opposed to excavated basitarsi 3 with large area in *tarsatus*), the elongate posterior surstyle lobe with dorsally projecting apical part, and the stronger inward curve of the apical posterior surstyle lobe region. *M.*

persicus differs from the description of *smirnovi* in the smaller size, the smaller tl-v ratio and the colour of the antennae.

Period of flight and distribution (fig. 85). – The species is known to occur in Iran; it flies in May.

Etymology. – The epitheton *persicus* is derived from the classical name Persia, indicating the region of occurrence of the species.

Merodon tangerensis sp. n.

(figs. 41 a-d, 87)

Type-material. – ♂ Holotype 'Environs de Tanger [Morocco], Fevrier 1859' (MNHN).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin convex, apex rounded, antennal ratio 3.3; pubescence pale yellow with dark hair-tuft in ocellar region; vertex angle 30°, ocellar angle 35°, touchline incomplete, tl-v ratio 0.15; face slightly, diffusely pruinose, occiput densely pruinose down sides, metallic lustrous; compound eyes showing whitish pubescence.

Thorax: Dark, slightly metallic lustrous on lateral dorsum and scutellum; katapisternum, anepisternum and anepimeron steel grey lustrous; dorsum with double paired anteriorly coalescent whitish pruinose bands; pubescence erect, yellow, moderately dense, distinctly uneven throughout, paler on sides. Wings clear, pale brown veined; halteres, squamae and antisquamae yellow.

Legs: Dark but apices of femora and bases and apices of tibiae lighter; trochanter 3 smooth, femur 3 swollen, black metallic lustrous, bearing normal triangular processus holding 6 bristles on serrate distal margin; tibiae normal, showing drawn-out distal medial angle bearing dense somewhat lengthened pubescence (this might be termed a subfloccus); basitarsi 3 swollen, with dense, yellowish, erect pubescence (densest medially); other tarsi 3 normal.

Abdomen: Dark, slender, tergites rectangular, slightly transverse, with white, slightly arcuate moderately wide pruinose bands, interrupted on T II, continuous on T III-IV; pubescence short, white on bands, dark elsewhere; S IV strongly keeled, deeply emarginate posteriorly.

Genitalia: The anterior surstyle lobe elongate, with apical part bearing short, even, yellow, dense pubescence, more scattered elsewhere; separated from posterior surstyle lobe by deep sulcus; posterior surstyle lobe high, apically curving medially; with marked antero-ventral angle, posteriorly rounded, there with moderately dense rather long yellow pubescence.

Cercus inconspicuous, bearing long dense yellow pubescence. Aedeagus slender, fringed plates recumbent, subapical cavity well marked.

Body length 8.5 mm.

Female. – Unknown.

Diagnosis. – *M. tangerensis* is distinguished from other species in this group by its very long antenna 3, the relatively small projection of S IV and the relatively large somewhat dorsally curving anterior surstyle lobe.

Period of flight and distribution (fig. 87). – This species is known only from the holotype, collected in northern Morocco in February.

Etymology. – The species is named after the site where the holotype was collected. The epitheton is to be used as an adjective.

Merodon tarsatus Sack

(figs. 42 a-e, 83).

Merodon tarsatus Sack, 1913a: 437. Holotype ♂: 'Pamir 49409/ Mer. tarsatus Sack det. Sack' (ZMHB) [examined].

Merodon smirnovi Paramonov, 1926b: 320. Holotype ♂: 'Ak-Tash, Prope Tashkent, Turkestan' [not examined, see discussion]. *Syn. nov.*

Merodon tarsatus; Paramonov 1926b: 320; Paramonov 1927: 76, 78; Peck 1988: 174.

Lampetia tarsata; Sack 1931: 328.

Merodon smirnovi; Paramonov 1927: 76, 78; Liepa 1969: 20; Peck 1988: 173.

Lampetia smirnovi; Sack 1931: 326.

Material examined. – U. S. S. R.: 1 ♂ 'Ak-Tash [41° 37' N, 69° 40' E], 9 vii 1923, Tashkent A.Zecholovtsev/ *Lampetia smirnovi* Param., S. Paramonov det. mm/ coll. J. Villeneuve' (KBIN); 1 ♀ 'Berkana, Turkestan, 24.vi.1925, Kuznetsov leg.' (ZMAS); 1 ♀ 'Ousj. Koydara, dol. R. Warzob, Tadj.' [river Warzob valley in Tadzhikistan, North of Dushanbe in 68° 50' E, between 38° 20' and 38° 55' N] (ZMAS).

Description

Male. – Head: Antennae brown, antenna 3 with upper margin edged, straight, apex subacute, antennal ratio 1.9; pubescence yellow, with dark hair-tuft in ocellar region; vertex angle 40°, ocellar angle 70°; tl-v ratio 0.3; face and occiput metallic greenish lustrous; central ocellus only half as large as the lateral ones; compound eyes with whitish pubescence.

Thorax: Strongly lustrous on lateral dorsum and scutellum, katapisternum, anepisternum and anepimeron; dorsum and scutellum with diffuse golden pubescence and scattered pruinosity, with 4 faint pruinose bands also showing. Wings ringed brown on central portions, clear marginally, veins very dark;

halteres, squamae and antisquamae yellow.

Legs: All joints and tibial bases yellow, otherwise dark; trochanter 3 sharply keeled, femur 3 swollen, metallic lustrous, triangular processus normal, bearing 6-8 bristles on serrate distal margin; tibiae 3 rather strongly curved, bearing large lamella on distal medial face with ruddy floccus inserted apically; floccus extends over half the length of basitarsi 3; these swollen, asymmetrical, with lower face showing large flat metallic lustrous area bearing stout bristle-like pubescence, bordered by very stout long pubescence; inner face of basitarsi 3 showing dense orange-yellow pubescence.

Abdomen: Dark, greenish yellowish metallic lustrous, rather slender; pubescence dense, moderately long, pale orange, partially obliterating roughly punctated surface; no pruinose bands; S IV modified, bearing large, slender paired appendages.

Genitalia: The anterior and posterior surstyle lobes separated by shallow sulcus, of about equal size; anterior surstyle lobe apically with short, dense, erect, yellow pubescence, of rectangular outline; posterior surstyle lobe moderately high, regularly rounded, bearing erect, long, yellow, uneven pubescence. Cercus of moderate size, with similar pubescence, slightly angular. Aedeagus robust, heavily sclerotized, apical shaft part short, fringed plates recumbent.

Body length 10.5-13 mm.

Female. – Rather different from the males, as noted by e.g. Sack, 1931; therefore a full description is given.

Head: Antenna 3 dark orange, subacute; antennal ratio 2-2.3; pubescence whitish; ocellar angle 70°; the central ocellus clearly smaller than the lateral ones; frons diffusely pruinose laterally, lustrous for median one-third; metallic lustre absent.

Thorax: Weakly greenish metallic lustrous on lateral dorsum and scutellum, katapisternum, anepisternum and anepimeron; pubescence rather short, erect, even, pale yellow. Wings as in male, slightly less tinged.

Legs: All femora dark, tibiae orange with dark distal band, femur 3 slightly swollen, triangular processus bearing 6 bristles on serrate distal margin; tibiae 3 short, otherwise normal; basitarsi 3 clearly swollen, not deformed, bearing dense golden pubescence; other tarsi 3 normal.

Abdomen: Dark, slightly metallic lustrous; pruinose bands on T II-IV narrow, whitish, arcuate, well defined, interrupted; pubescence yellow to white, deepest coloured and densest laterally on T II.

Body length 12 mm.

Diagnosis. – *M. tarsatus* can be distinguished in the males, by its deformed basitarsi 3 with the lustrous

area at the lower face which at once separates it from all other species; in the females, by the clearly swollen basitarsi 3 and the great antennal ratio.

Period of flight and distribution (fig. 83). — *M. tarsatus* occurs in Tadzhikistan, and adjacent regions, where it flies in June and July.

Discussion. — In the original description the colour of the pubescence of the holotype is said to be foxy-red, its size as 12 mm; the colour has apparently faded, while the specimen was measured recently at 10.5 mm only. The synonymy of *smirnovi* with *tarsatus* was established after examination of one of the specimens (originating from the type-locality of *smirnovi*) identified as *smirnovi* by Paramonov, and matching the description as well as the holotype of *tarsatus*. Moreover, the females, all identified previously as *smirnovi*, match the description of the ♀ *tarsatus* as provided by Sack. Furthermore Sack (1931) noted the specialized setaceous area on the basitarsus 3 of *smirnovi* which he failed to observe in *tarsatus*, but which is easily seen on the holotype of *tarsatus*. Sack gave a difference in the tl-v ratios between *tarsatus* and *smirnovi* (the ratio of *tarsatus* being greater) in his key to the species (Sack, 1931), but checking of the holotype of *tarsatus* showed that the tl-v ratio in that species is about 0.3, whereas the ratio given by Paramonov for *smirnovi* is 0.5. Therefore Sack's interpretation that two species are involved is not followed here; in view of the above arguments *smirnovi* is considered synonymous with *tarsatus*.

Merodon turkestanicus Paramonov (figs. 43 a-e, 86)

Merodon turkestanicus Paramonov, 1926b: 319. Holotype ♂: 'Tashkent, Tadzhikistan, 12.v.1915' [U. S. S. R.] [not examined].

Merodon turkestanicus, Paramonov 1927: 75; Liepa 1969: 20; Peck 1988: 175.

Lamptetia turkestanica; Sack 1931: 330.

Material examined. — Iran: 1 ♂ 'Kuh-e-Hazaran, S. Rayen Kerman [29° 24' N, 57° 22' E], 3800 m, 25.v.1978 leg. K. Warncke' (JLR); U. S. S. R.: 2 ♂ 'Outsj. Koydara, dol. R. Warzob Tadj. [68° 50' E, 38° 20' to 38° 50' N], Warzob river, Tadzhikistan] Stackelberg 6.v.43' (ZMAS); two ♀ from same locality and collector, dated 2.v.44 (ZMAS, BMNH); 1 ♀ 'Outsj. Kwak. Werch. Koydarye Tadj. [in same region as holotype] Stackelberg 27.v.43' (RMNH); 1 ♂ 'Hissar mountains Tadzhikistan [same region], Stackelberg 3.v.44' (RMNH).

Description

Male. — Head: Antennae dark, antenna 3 with upper margin straight, apex obtuse, antennal ratio 2.1;

vertex conspicuously large; vertex angle 45°, ocellar angle 50°, ocelli large, tl-v ratio 0.15, touchline incomplete; pubescence pale yellow, dark in ocellar region, on compound eyes sparse, yellowish.

Thorax: Moderately strong metallic lustrous on lateral dorsum, scutellum and sides, background colour dark; pubescence rather sparse, uneven, pale yellow. Wings clear throughout; halteres, squamae and anti-squamae pale yellow.

Legs: All dark, tibiae and tarsi 1-2 with dense yellow pubescence giving false impression of light colour; trochanter 3 with small rounded knob, femur 3 swollen, strongly metallic lustrous, with triangular processus strongly serrate apically, tibiae 3 with conspicuous apical spur bearing strong floccus; basitarsi 3 very much swollen, bearing dense, short, yellow, even pubescence medially; other tarsi 3 normal.

Abdomen: Outline rather stout, background colour dark, obliterated by strong metallic lustre and moderately dense, yellowish, even pubescence; no traces of pruinosity or lateral spots. S IV bears conspicuous paired appendages.

Genitalia: Anterior and posterior surstyle lobes separated by deep narrow sulcus; anterior surstyle lobe bearing rather dense, yellow, erect, even pubescence apically; posterior surstyle lobe showing scattered, long, yellow pubescence, densest posteriorly. Cercus rectangular, well protruding, bearing long, erect, yellow pubescence. Aedeagus stout, apical shaft part short, fringed plates on thecal apex recumbent.

Body length 9 mm.

Female. — Except for sexual dimorphism, differing from the male as follows. Head: Eyes separate widely, ocellar angle 55°, frons lustrous throughout, partially dulled laterally by light pruinosity. Legs: The basitarsi 3 slightly but distinctly swollen, with a length/width ratio about 3.0. Abdomen: Appendages on S IV lacking.

Body length 9 mm.

Diagnosis. — The males of *turkestanicus* can be distinguished from other species in this group by the large vertex, all dark legs, structure of tibiae 3 and basitarsi 3 and strong metallic lustre; the females by the swollen basitarsi 3 and dark legs.

Period of flight and distribution (fig. 86). — *M. turkestanicus* occurs in Tadzhikistan and Turkestan, and Iran, in mountain areas, flying there during May and June.

Discussion. — The identification of the specimens, some by Paramonov, seems to be correct; all specimens match the original description.

Merodon xanthipous sp. n.
(figs. 44 a-c, 85)

Type-material. – ♂ Holotype 'Iran, Chiraz, 11.iv.1937, coll. F. H. Brandt / *L. crassicornis* Sack, det. v. Doesburg' (ZMAN). 1 ♀ Paratype 'Iran, Rd. Chiraz Kazeroun, Ft. Sine-Sefid, 19.iv.1937, coll. F. H. Brandt / *L. crassicornis* Sack, det. v. Doesburg' (ZMAN) [both localities at about 29° 30' N, 52° E].

Description

Male. – Head: Antennae brown, antenna 3 orange, upper margin slightly concave, apex acute, antennal ratio 2.1; vertex angle = 35°, ocellar angle = 45°; pubescence pale yellow, with hardly any dark pubescence in ocellar region; tl-v ratio 0.15, touchline incomplete; head without metallic lustre.

Thorax: Dark, lacking metallic lustre; katapisternum, anepisternum and anepimeron with some dullish blue tinge; pubescence sparse, brown, uneven, moderately long; some diffuse pruinosity present on sutures; vestigial pruinose bands can be seen at certain angles on posterior dorsum. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: All pale brown; trochanter 3 with low knob bearing yellow hair-tuft, femur 3 slightly curved, swollen, with rather high triangular process showing apical spur, bearing one strong and 5-6 lesser bristles; tibiae 3 with apical flocus reaching down basal half of basitarsi 3, inserted on drawn-out medial distal angle; basitarsi 3 swollen, bearing rather dense, brownish yellow, erect, short, even pubescence throughout, densest on medial face; other tarsi normal.

Abdomen: Very dark brownish red, tapering posteriorly, especially T II; slightly arcuate, faint, narrowly interrupted whitish pruinose bands present on T II-IV; pubescence pale brown, erect, uneven; S IV bearing robust large paired appendages that are smaller than in other species of this group, but still very conspicuous.

Genitalia: The anterior surstyle lobe rather spatulate, with dense, yellow, erect, even pubescence dorsally and apically, more scattered on other parts; separated from posterior surstyle lobe by shallow sulcus; posterior surstyle lobe steeply rising, anteriorly high, with distinct slight anteroventral angle and rather dense, erect, yellow, uneven pubescence posteriorly; cercus somewhat elongate, rather wide, with dense, long, yellow pubescence; aedeagus moderately slender, with marked subapical cavity, fringed plates on thecal apex suberect, apical shaft part slightly lengthened.

Body length 7 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Antenna 3 rounded,

more obtuse; frons lustrous (not metallic) throughout, eyes widely separate, ocellar angle 60°. Thorax: Showing dull bluish-greenish lustre on dorsum, scutellum and sides. Legs: Deeper brown than in male. Abdomen: Stoutier than in males, darker, pruinose bands more marked; T II-V with a micaceous lustre.

Body length 7 mm.

Diagnosis. – The species can be distinguished in both sexes by the relatively pale, uniformly coloured legs; the males are also distinguished by the relatively smaller appendages on S IV and the steeply rising posterior surstyle lobe as well as by the absence of metallic lustre.

The former identification as *crassicornis* Sack, previously applied to the holotype and paratype, is incorrect in view of contradictions of characters in the types of *xanthipous* with the description of *crassicornis*. In the females of the latter species the abdominal pruinose bands are stated to be wide and clear, the antennae are dark, the compound eyes bearing very dense pubescence, the legs are black with yellow markings; moreover bands of long white pubescence are stated to be present on the posterior tergite margins. The male of *crassicornis* has not been described.

Period of flight and distribution (fig. 85). – The species, known only from the types, occurs in south-western Iran in April.

Etymology. – The epitheton *xanthipous*, to be treated as a noun in apposition, refers to the golden brown leg coloration, and is derived from the greek *xanthos*, meaning blonde, and *pous*, meaning foot.

The *clavipes* group

Apomorphies: Anterior surstyle lobe elongate, densely pubescent and strongly to enormously enlarged.

Description. – Head: Antennae with antennal ratio 1.4 to 2.0, antenna 3 mostly subacute; pubescence on head whitish to yellow, usually dense on frons; face often bluish lustrous; tl-v ratio in the males 0.3 to 0.5. Thorax: Dark, lustrous on dorsum and scutellum, mostly with strong blue lustre on katapisternum, anepisternum and anepimeron; pubescence most variable in colour density and length; some species have slightly to strongly infusate wings. Legs: Mostly all dark, in some cases tibiae 1 and 2 basally with orange markings; femur 3 usually much swollen, curved, in some cases straight and slender; triangular process, tibiae 3 and tarsi 3 normally shaped. Abdomen: Moderately slender to slender or stout; T II tapering (less strongly in the females); arcuate pruinose bands present on T II-IV which may in some species be difficult to see through the dense abdominal pubes-

cence. Genitalia: The anterior surstyle lobe very large, rounded-rectangular, ridged laterally, usually with short even pubescence throughout; posterior surstyle lobe variously shaped, with dense pubescence, with specialized hair-tufts in *warnckei*, *aberrans*, *hamifer* and *brevius*; cercus variable; aedeagus mostly slender, apical shaft part short to slightly lengthened, fringed plates recumbent to oblique.

Merodon aberrans aberrans Egger

(figs. 45 a-d, 50 b, 89)

Merodon aberrans Egger, 1860: 10. Lectotype ♂ (here designated): 'Austria Alte Sammlung/ Merodon aberrans Egger' (NHMW) [examined].

Merodon obscuripennis Palma, 1863: 47. [No type material mentioned in original description].

Merodon kneri Mik, 1867: 415. Syntypes: 'Halicia' [not examined].

Merodon aberrans; Mik 1867: 417, 1883: 182; Bezzi 1900: 89; Sack 1913a: 435; Paramonov 1925: 153; Liepa 1969: 20; Gaunitz 1969: 82, 86; Van der Goot 1981: 215, 218; Peck 1988: 166.

Lampetia aberrans, Oldenberg 1919: 388; Sack 1931, 302; Séguy 1961: 174.

Merodon obscuripennis; Peck 1988: 166.

Merodon knerii; Mik 1883: 182; Peck 1988: 166.

Lampetia kneri; [sic!] Sack 1931: 302.

Material examined. — Albania: 8♂ (NHMW, RMNH); Austria: 8♂ paralectotypes and 2♀ paralectotypes of *aberrans*, with same label as lectotype; Czechoslovakia: 1♀ (ZMAN); France: 47♂, 8♀ (MNHN); Greece: 23♂, 11♀ (KBIN, BMNH, JLR, ZMUC, WH, RMNH, ZMAN); Hungary: 3♂ (NHMW, RMNH); Italy: 64♂, 46♀ (NHMW, BMNH, JLR, ZMAN); Lebanon: 1♂, 1♀ (KBIN, NHMW); Poland: 1♂, 1♀ (BMNH); Romania: 2♂ (BMNH); Turkey: 136♂, 45♀ (BMNH, JLR, WH); U. S. S. R.: 15♂, 14♀ (NHMW, ZMAS); Yugoslavia: 23♂, 5♀ (NHMW, JLR, BMNH, ZMAN, RMNH).

Description

Male. — Head: Antennae dark, antenna 3 with upper margin convex, apex obtuse to subacute, antennal ratio 1.6; pubescence yellow, with dark tuft in ocellar region; vertex angle 40°, ocellar angle 50°, tl-v ratio 0.4; compound eyes showing white pubescence; face variably bluish lustrous, mostly only weakly.

Thorax: Blue lustrous on lateral dorsum and scutellum, katapisternum, anepisternum and anepimeron; pubescence yellow, moderately dense, with dark interalar band mostly clear. Wings troubled evenly in distal half, anterior veins pale; halteres, squamae and antisquamae pale yellow.

Legs: All dark, all femora slender; femur 3 straight; trochanter 3 smooth, femur 3 bearing normally shaped triangular processus bearing 6-11 bristles; basitarsi 3, tibiae 3 and tarsi 3 normal. In most specimens tibiae and tarsi with bright yellow pubescence.

Abdomen: Dark, with characteristic rather strong bluish overall lustre; T II strongly tapering; T II-IV

with slightly arcuate, well interrupted pruinose bands; vague mainly yellow pruinose lateral spots on T II present in some specimens; S IV moderately arched, deeply, narrowly emarginate posteriorly.

Genitalia: Anterior surstyle lobe large, anteriorly bearing dense, short, even, yellow pubescence, with scattered pubescence throughout, showing lateral ridge; coalescent with posterior surstyle lobe; the latter bearing low anteroventral projection with dense, long, yellow pubescence; posterior surstyle lobe with long, dense, yellow pubescence. Cercus conspicuous, rather quadrate with rounded corners. Aedeagus smooth on outer face, moderately slender, apical shaft part short, fringed plates on thecal apex recumbent.

Body length 12-16 mm.

Female. — Except for sexual dimorphism, differing from the male as follows. Head: Antenna 3 more obtuse; frons laterally pruinose, lustrous on median one-third or just over; ocellar angle = 40°, pubescence on frons less dense. Thorax: Pubescence brownish, interalar band less clear; vague longitudinal pruinose bands often present; wings in some specimens more clearly infusate distally. Abdomen: T II less tapering, pubescence very dense in some specimens; T V relatively narrow, posteriorly more or less acute.

Body length 12-15 mm.

Diagnosis. — As the slender femora 3 are not found in other species and the blue lustre is uncommon in a species of this large size, *aberrans* is hardly ever confused with other species; only *hamifer* is very similar but can be separated at once by its deformed triangular processus; *brevius* is superficially similar but stouter, lacks the interalar band in the males which moreover have slightly different genitalia (see fig. 45); *splendens* has a wider, shorter abdomen, denser pubescence and the femora 3 are much more swollen than in *aberrans*.

Period of flight and distribution (fig. 89). — The species occurs from May through July in central Europe and the Mediterranean, in southern parts of Russia, Ukraine and in Asia Minor.

Merodon aberrans ssp. *flavitibius* Paramonov

Merodon aberrans ssp. *flavitibius* Paramonov, 1925: 153.

Syntypes: 'Armenia' [not examined].

Merodon aberrans ssp. *flavitibius*; Liepa 1969: 20; Peck 1988: 166.

Lampetia aberrans ssp. *flavitibius*; Sack 1931: 302.

Description

Subspecies *flavitibius* differs from the nominate subspecies only in the colour of the legs, which in the

present subspecies show yellow markings on the basal parts of tibiae 1 and 2.

Period of flight and distribution. – This subspecies occurs in Armenia.

Merodon aberrans isperensis ssp. n.
(fig. 90)

Type-material. – ♂ Holotype 'Türkiye, Rize, Ovit Pass [near İspir], S side 1800 m, 16.vii.1987, leg. J. A. W. Lucas' (ZMAN). 43♂, 24♀ paratypes, all from Turkey, all in (JLR) and all leg. Lucas, except where noted: Topotypic 1♀, 31.vii.1983; 1♂, 1♀, 16.vii.1986; 1♂ 'Turkey Hakkari, Suvarihalil pass 1250 m W side nr. Habul Deresi 13.vi.1984'; 4♀ 'Turkey Hakkari, Tanin-Tanin pass W side 1700 m, 12.vi.1984'; 1♀ 'Turkey, Kars, Handere 2100 2200 m, 20 km W of Sarıkamış, 1.viii.1983'; 2♂, 1♀ 'Turkey, Siirt 21 km W of Uludere, 12.vi.1984'; 3♂ 'Turkey, Kars, 25 km W. of Sarıkamış 5.viii.1985, 2100 m, C. J. Zwakhals leg.'; 3♂ 'Turkey, Kars, Bahnstat. Soganlı W. Sarıkamış 2100 m 5.vii.1985 W. Schacht'; 1♀ 'Turkey, Hakkari, Sat Dagi, Vargös, SW Yüksekova 1700 m 29.vi.1985 W. Schacht'; 13♂, 4♀ 'Turkey, Bingöl, Buglan Geçidi 1640 m 5.vii.1986'; 1♂, 1♀ 'Turkey, Kars 11 km E of Karakurt 1450 m 6.vii.1986'; 6♂, 2♀ 'Turkey, Kars, 8 km W Sarıkamış, 2000 2050 m 6-9.vii.1986'; 2♂, 1♀ 'Turkey, Kars, Handere 20 km W Sarıkamış 2000 m 7.vii.1986'; 1♂, 1♀ 'Turkey, Kars, 12 km S Sarıkamış 2050 m, 7.vii.1986'; 10♂, 6♀ 'Turkey, Erzurum (Kayak) Palandöken Dağı 2200-2300 m 1.vii.1986'. See map showing Turkish localities (fig. 79).

Description

Male. – Head: Pubescence more grey than in nominate subspecies, otherwise similar.

Thorax: Slenderer than in nominate subspecies, bearing less dense pubescence; interalar band less clear.

Legs: Similar to nominate subspecies, but pubescence pale yellow, not golden.

Abdomen: Clearly less wide than in nominate subspecies, showing slate grey instead of bluish lustre; pubescence slightly less dense.

Genitalia: completely similar to nominate subspecies.

Body length 10-15 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Thorax: The infuscation of the apical wing portions is less strong than in females of the nominate subspecies.

Period of flight and distribution (fig. 90). – This subspecies occurs in June through August in the mountains of eastern Turkey. The distributions of the nominate form of *aberrans* and of the ssp. *isperensis* are shown in figs. 89-90.

Etymology. – The adjective *isperensis* refers to the type-locality in the vicinity of the town of İspir in north-eastern Turkey.

Merodon brevis Paramonov
(figs. 46 a-c, 86)

Merodon brevis Paramonov, 1925: 157. Holotype ♂: 'Inaklu, Bez. Etschmiadzin, Gouv. Erivan, (Armenien), Südlicher Abhang des Alagöz, 4500' [Gora Aragac, 40° 29' E, 44° 12' E]' [Armenia] [not examined, considered lost].

Merodon brevis, Peck 1988: 168.

Lampetia brevis, Sack 1931: 308.

Material examined. – U. S. S. R.: 1♂, Armenia, Abaran [Aparan, 40° 34' N, 44° 21' E], M. Karny-larich, 8000', 10.vii.26. A. Shelk / *Lampetia brevis* Param. ♂, S. Paramonov det./ Coll. J. Villeneuve, *Lampetia brevis* Param. (KBIN).

Description

Male. – Head: Antenna with articles 1-2 brown, 3 conspicuously orange, with upper margin convex, apex subacute, antennal ratio 1.7; pubescence white, long, dense on frons, sparser on face, golden on occiput, darker on vertex; face blue lustrous, partially with dense, pale pruinosity, vertex angle 35°, ocellar angle 50°, tl-v ratio 0.5.

Thorax: Dark, lateral dorsum and scutellum, katepisternum, anepisternum and anepimeron greenish lustrous, showing rather dense, golden, erect pubescence; two faint longitudinal pruinose bands present on dorsum; no interalar band. Wings rather clear, very pale brown veined; halteres, squamae and anti-squamae yellow, halteres deepest coloured.

Legs: Dark, but tibiae 1 and 2 orange on basal half. Trochanters 3 smooth, femora 3 swollen, steel grey lustrous, bearing rather large triangular processus with strongly serrate distal margin bearing 5-6 bristles; tibiae and tarsi normally shaped, tarsi 3 with golden pubescence laterally, dark on upper face.

Abdomen: Relatively small, rather stout; dark, with interrupted well-defined arcuate interrupted pruinose bands; pubescence pale anterior and dark posterior, longest laterally; no lateral spots; S dark, S IV vaulted, moderately deep emarginate posteriorly.

Genitalia: Anterior surstyle lobe elongate, recurved dorsally, apically wide, stalked, with clear lateral ridge, with dense, short, erect, yellow pubescence throughout, bearing small dorsal basal projection; posterior surstyle lobe rather quadrate, two more sclerotized areas on ventral margin bearing dark bristle-like pubescence; pubescence otherwise as on anterior surstyle lobe but longer laterally. Cercus rather small, bearing short, dense, erect, yellow, uneven pubescence. Aedeagus moderately slender, apical shaft part short, fringed plates recumbent.

Body length 12 mm.

Female. — Unknown.

Diagnosis. — *M. brevis* most closely resembles *aberrans* from which it is distinguished by the shorter body, more elongate anterior surstyle lobe and uniformly coloured thoracic pubescence; the areas of specialized pubescence on the posterior surstyle lobe are not found in *aberrans*. Moreover, this species differs from *aberrans* by the orange markings on the legs. In this respect *brevis* resembles *aberrans* ssp. *flavitibius*. No material of the latter taxon has been examined, but the other characters mentioned should be sufficient to distinguish these taxa.

Period of flight and distribution (fig. 86). — *M. brevis* has been found in the mountains of Armenia [approx. 40° 30' N, 44° 20' E], where it was collected in July.

Discussion. — The identification as *brevis*, by Paramonov, is considered reliable; the specimen examined originates from a site less than 20 km from the locus typicus.

Merodon clavipes (Fabricius) (figs. 47 a-c, 89)

Syrphus clavipes Fabricius, 1781: 427. Lectotype ♂ (here designated): 'clavipes' in Sehestedt & Tønder Lund collection (ZMUC) [examined].

Merodon clavipes var. *albus* Paramonov, 1927: 90. Syntypes: 'Bezirk Balta, Gouv. Odessa' [Ukraine, U. S. S. R.] [not examined].

Merodon clavipes var. *ater* Paramonov, 1927: 91. Syntypes: locality unknown [not examined].

Merodon clavipes var. *niger* Paramonov, 1927: 90. Syntypes: 'Bezirk Balta, Gouv. Odessa' [not examined].

Merodon canipilus Rondani, 1865: 131. Lectotype ♂ (here designated): '52' [number refers to description of *canipilus*] in coll. Rondani (TSF) [examined].

Musca clauda Villers, 1789: 463. Syntype(s): 'Gallia Australior' [the southernmost of France] [not examined].

Musca curvipes Gmelin, 1790: 2871. Published in synonymy with *Syrphus clavipes* Fabricius, 1781.

Syrphus clavipes Rossi, 1790: 286. Syntypes: 'in provinciis Florentina et Pisana' [Toscana, Italy] [not examined].

Lampetia sacki Paramonov, 1937a: 3. Lectotype ♀ (here designated): 'Chiklana' [Chiklana de la Frontera, near Jerez, southern Spain] (ZBSM) [examined]. Syn. n.

Merodon senilis Meigen, 1822: 356. Lectotype ♀ (here designated): 'senilis' (NHMW) [examined].

Syrphus clavipes, Fabricius 1787: 337; Rossi 1790: 286; Fabricius 1794: 292.

Lampetia clavipes, Meigen 1800: 34; Coquillett 1910: 557; Oldenberg 1919: 388; Sack 1931: 310; Séguéy 1961: 176.

Lampetia clavipes var. *alba*; Sack 1931: 311.

Lampetia clavipes var. *atra*; Sack 1931: 311.

Lampetia clavipes var. *nigra*; Sack 1931: 311.

Merodon clavipes, Fabricius 1805: 195; Latreille 1804: 443; Meigen 1822: 351; Macquart 1828: 291; Macquart 1834: 513; Westwood 1840: 137; Macquart 1842: 70; Rondani 1845: 256, 259; Macquart 1849: 466; Walker 1849: 597; Rondani 1857: 54, 62; Schiner 1857: 410; Schiner 1862: 344; Palma 1863: 46; Portsichinsky 1877: 184; Strobl 1893: 76; Bezzi 1895: 16; Bezzi 1900: 89; Strobl 1900: 593; Verrall 1901: 559; Villeneuve 1903: 115; Sack 1913a: 433; Paramonov 1925: 146; Gil Collado 1930: 243, 246; Gaunitz 1969: 83, 86; Delfinado & Hardy 1975: 343; Marcos García 1985: 197; Hurkmans 1985: 69; Bradescu 1986: 123; Peck 1988: 165, 168 (see for additional references Kertész, 1907: 274).

Merodon clavipes var. *albus*, Liepa 1969: 20; Peck 1988: 169.

Merodon clavipes var. *ater*, Liepa 1969: 20; Peck 1988: 169.

Merodon clavipes var. *niger*, Liepa 1969: 20; Peck 1988: 169.

Milesia clavipes, Latreille 1810: 331.

Merodon canipilus, Peck 1988: 169.

Lampetia canipila; Sack 1931: 310 (as syn. of *clavipes*).

Musca clauda; Kertész 1907: 274; Peck 1988: 168.

Musca curvipes, Peck 1988: 168.

Merodon curvipes, Meigen 1803: 74 (erroneous); Peck 1988: 168.

Lampetia curvipes, Sack 1931: 310 (as syn. of *clavipes*).

Syrphus gravipes, Peck 1988: 168.

Merodon senilis, Peck 1988: 168.

Material examined. — Algeria: 32♂, 5♀ (MNHN, BMNH, ZMAN, ZMUC); Austria: 10♂, 2♀ (NHMW); France: 143♂, 61♀ (MNHN, NHMW, Bonn, BMNH, ZMUC, ZMAN); Greece: 117♂, 37♀ (ZMUC, den Hollander, NHMW, Bonn, BMNH, Thessaloniki, ZMAN, JLR, WH); Hungary: 5♂, 4♀ (BMNH, ZMUC); Italy: 116♂, 57♀ (ZMUC, JLR, NHMW, BMNH, ZMAN, WH); Morocco: 1♀ (BMNH); Spain: ♀ Paralectotype of *Lampetia sacki*: 'Chiklana' (ZBSM) and 20♂, 5♀ (JLR, ZMUC, BMNH, Bonn, ZMAN); Sweden: 1♀, Bohuslan, leg. Malm, 1862 (MNHN); Switzerland: 1♂, 2♀ (ZMUC); Yugoslavia: 31♂, 5♀ (BMNH, NHMW, JLR, ZMAN).

Description

Male. — Head: Antennae dark, antenna 3 with upper margin concave, apex subacute, vertex angle 50°, ocellar angle 60°, antennal ratio 1.8; pubescence yellowish, darker in ocellar region; face dense white pruinose; tl-v ratio 0.4.

Thorax: Dark, slightly metallic lustrous on lateral dorsum, scutellum, katapisternum, anepisternum and anepimeron, pubescence yellow to brown, erect, rather dense, with dark interalar band. Wings troubled evenly, halteres, squamae and antisquamae pale yellow.

Legs: All dark, trochanters 3 with high ridge shaped like chisel edge; femora 3 curved, very strongly swollen, often with oily lustre, and golden pubescence; triangular process normally shaped, tibiae 3 and tarsi 3 normal.

Abdomen: Dark; T II-IV with interrupted arcuate wide pruinose bands and dense pubescence, yellow on T II and III (anteriorly) and orange on posterior abdomen; T II clearly but not very strongly tapering,

normally without lateral spots; S IV strongly vaulted, posterior margin widely and deeply emarginate.

Genitalia: The anterior surstyle lobe extremely large, bearing short, dense, yellow, even pubescence throughout, laterally ridged; posterior surstyle lobe coalescent, steeply rising, rather high, long, uneven, with less dense pubescence. Cercus well protruding, angular, with dense, long, yellow pubescence. Aedeagus slender, smooth on outer face, somewhat concave subbasally, apical shaft part slightly lengthened, fringed plates on thecal apex recumbent-oblique.

Body length 17-23 mm.

Female. – Quite different from the males, as they lack the dense abdominal pubescence. Apart from sexual dimorphism the main other differences are: Head: Frons whitish pruinose, leaving lustrous mid-stripe occupying one-fifth of width. Thorax: Pubescence greyish, shorter than in males, rather even, no interalar band. Legs: The femur 3 slightly less swollen, often pubescence duller; compared with other *Merodon* females, still very much swollen. Abdomen: Pubescence overall much less conspicuous; dense only in anterolateral areas of T II, and on pruinose bands; in some specimens large portions of the tergites bald altogether; colour of the pubescence mainly dark yellow to pale; in many specimens pale orange lateral spots can be seen.

Body length 15-22 mm.

Varieties of *clavipes* and variation. – In the var. *albus* the pubescence is white throughout, except for a black interalar band in both sexes with blue background lustre. In the var. *ater* the thoracic dorsum shows only black pubescence; of this variety only the males are known. In the var. *niger* the pubescence is black throughout, except on the face, while the pruinose abdominal bands are almost or completely absent in both sexes. No types of either of the varieties have been examined; they are considered to be lost (Liepa 1969: 4).

Apart from the described varieties and size variation the specimens of this species are remarkably uniform. A few aberrant individuals totally lack the pubescence on the abdomen and have strangely vaulted posterior tergite margins. These specimens are not considered to belong to a separate variety. Possibly they have suffered from frost damage, known to produce aberrances in insects.

Diagnosis. – *M. clavipes* is easily distinguished from other species in this group by its size. Moreover, the combination of enormously swollen femora 3 and chisel-edged trochanters 3 does not occur in males of any other species; the degree of swelling in the femo-

ra 3 in the females far exceeds that of any other *Merodon* currently known.

Period of flight and distribution (fig. 89). – *M. clavipes* occurs from late April through August in southern Europe, the Mediterranean and Asia Minor, though it may occasionally occur more northward; the specimen from Sweden seems unquestionable; reports of *clavipes* from Great Britain have been seriously doubted by Verrall (1901).

Biology. – The territorial behaviour of the males has been described by Hurkmans (1985). In the field the males visit flowers, mainly of Umbelliferae, and are conspicuous, but the females fly close to the soil through the vegetation.

Discussion. – The types of *canipilus*, *sacki* and *senilis* have been examined, and found conspecific with *clavipes*. The types of *clauda*, *curvipes* and *gravipes* have not been examined. The original description of *clauda* leaves hardly any doubt that this is a synonym of *clavipes*; this synonymy has been considered by Kertész (1907: 274), while Peck (1988: 168) also names *clauda* as synonym of *clavipes*. *Musca curvipes* was originally published as a synonym of *Syrphus clavipes*. *Syrphus gravipes* refers to the publication of the female of *clavipes*, a possibility already considered in the original description.

Merodon cupreus sp. n.

(figs. 48 a-c, 88)

Type-material. – ♂ Holotype 'Turkey, Kars, Handere 2100-2200 m, 20 km W of Sarikamis, 1.viii.1983, leg. J. A. W. Lucas' (ZMAN). Paratypes: 29 ♂, 5 ♀; 24 ♂, 4 ♀ topotypic, with dates '1.viii.1983' and '2.viii.1983' (JLR), 1 ♀ with same data (ZMAN); 3 ♂ 'Turkey, Hakkari S. of Yüksekova 28.vi.1986 W. Schacht' (JLR); 2 ♂ 'Turkey, Kars, 8 km W. of Sarikamis 2000-2050 m, 9.vii.1986' leg. J. A. W. Lucas (JLR).

Description

Male. – Head: Antennae dark, antenna 3 cordate, apex subacute; antennal ratio 1.4; vertex angle 30°, ocellar angle 35°, pubescence yellow, often with dark tuft in ocellar region; face and occiput white pruinose, somewhat bluish lustrous; tl-v ratio 0.35.

Thorax: Dark, metallic lustrous on lateral dorsum and scutellum, katapisternum, anepisternum and anepimeron; pubescence deep yellow to brown, even, rather dense, with dark interalar band. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: Dark, but tarsi laterally with golden pubescence, contrasting; trochanter 3 sharply keeled, with chisel edge, femur 3 rather swollen, slightly lustrous, with normally shaped triangular process bearing 6-

7 bristles on very strongly serrate distal margin; tibiae 3 normal, basitarsi 3 slightly swollen.

Abdomen: Dark, no lateral spots on T II; T II-IV with white pruinose bands, straight on T II, arcuate on T III-IV; interrupted on T II-III, continuous on T IV; pubescence golden to brassy or orange, rather dense, recumbent; T II tapering; S IV vaulted, deeply, rather narrowly emarginate posteriorly.

Genitalia: The anterior surstyle lobe large, rounded, with basal projection on ventral margin, and dense, short, even, yellowish pubescence anteriorly; laterally weakly ridged; the posterior surstyle lobe separated by shallow sulcus, low, elongate, bearing yellow, moderately long, uneven pubescence along ventral and posterior margins. Cercus small but well protruding, with dense, long, yellow pubescence. Aedeagus moderately slender, fringed plates on thecal apex oblique, apical shaft part short.

Body length 12-15.5 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Frons tapering posteriorly, sides white pruinose, lustrous midstripe occupying one-third of width; pubescence grey, but dark tuft present in ocellar region; ocellar angle 60°. Thorax: Dorsum dull, pubescence grey, dark interalar band present. Legs: Dark, with grey pubescence; on tibiae and tarsi yellow-grey pubescence with some contrast as in ♂ but weaker; trochanter 3 smooth; triangular processus as in males. Abdomen: Stoutier than in male, with rather dense grey pubescence, pruinose bands moderately wide, continuous, arcuate; tergite V dark, with scattered grey pubescence.

Body length 13 mm.

Diagnosis. – At first sight, *cupreus* seems to be a small *clavipes*. Differences between those species are: antennal ratio in *cupreus* 1.4, in *clavipes* 1.8; antenna 3 with upper margin convex in *cupreus*, concave in *clavipes*; triangular processus stronger serrate in *cupreus* than in *clavipes*; in the males of *clavipes* the anterior surstyle lobe is much larger than in those of *cupreus*; in the female *cupreus* lateral abdominal spots lacking in, present in *clavipes*; size in *clavipes* 15-23 mm, as opposed to 12-15.5 mm in *cupreus*. The differences between *dzhaliatae* (discussed hereafter) and *cupreus* are: antenna 3 with upper margin convex in *cupreus*, concave in *dzhaliatae*; on the hind legs the tarsi II in *dzhaliatae* are almost as long as the basitarsi; in *cupreus* they are less than half as long. Moreover, in the males of *cupreus* the S IV is deeply emarginate posteriorly while this element is entire in *dzhaliatae*.

Differences with the description of *M. clavipes* var. *albus*, stated to have all black and white pubescence in both sexes, are: The size in *clavipes* var. *albus* is greater, in *cupreus* the pubescence is not black and white in

both sexes. Moreover, the differences (with respect to *clavipes*) already mentioned apply. The ♀ *cupreus* are of the same size and habitus as those of *femoratus*. They are distinguished by their lack of pruinose bands on the thorax and much denser overall pubescence; also the shape of the antenna 3 is different: ovoid to cordate in *cupreus*, more elongate in *femoratus*.

Period of flight and distribution (fig. 88). – *M. cupreus* occurs in July and August in eastern Turkey.

Etymology. – The adjective *cupreus* refers to the colour of the larger portion of the abdominal pubescence in the male of this species.

Merodon dzhaliatae Paramonov (fig. 99)

Merodon dzhaliatae Paramonov, 1927: 89. Holotype ♂: 'Hissar, Yalta' [south slope of the Crimea mountains, Crimea, Ukraine] [not examined, considered lost].

Merodon dzhaliatae, Liepa 1969: 20; Van der Goot 1981: 215; Peck 1988: 169; Zimina 1989: 24.

Lampetia dzhaliatae, Sack 1931: 313.

Description

The description of *dzhaliatae* presented here is based on the original description, on Sack (1931: 313) and on Zimina (1989: 24) who described recently collected material of both sexes.

Male. – Head: Antennae dark, antenna 3 yellow-brownish, upper margin concave, lower margin convex, apex acute; face, frons and vertex with yellow pubescence, face sparsely pruinose; compound eyes with yellow pubescence; tl-v ratio 0.5.

Thorax: Dorsum dark with some weak blue lustre, with conspicuous orange pubescence throughout, scutellum concolorous, duller; wings slightly troubled; reddish pubescence clear, interalar band sometimes present.

Legs: All dark, with yellow pubescence, femur 3 normal, resembling this element in *avidus* [therefore less swollen than in e.g. *clavipes*], triangular processus with strong apical pedestal (cf. Zimina 1989: fig. 2); on hind legs the second tarsi almost as long as basitarsi.

Abdomen: T II slightly tapering only, clearly bluish lustrous, T III-IV with white pruinose bands, just interrupted on T III, just continuous on T IV; pubescence reddish, but black, short and recumbent on posterior margins of T II-III. S IV with posterior margin entire, keeled.

Body length 13 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Habitus: Pubescence overall

paler than in male. Head: With broad lustrous mid-stripe on frons. Antenna 3 less long than in ♂, ovoid, dark with paired yellow spots ventrally. Legs: Tibiae brownish basally. Abdomen: T II showing nearly triangular greenish metallic lustrous lateral spots which are reddish translucent mediad. Pubescence dark, short and recumbent on T II-III, reddish elsewhere.

Body length 13 mm.

Diagnosis. – The differences with respect to *cupreus*, which seems to resemble *dzhalitae* most closely, are as follows. Third antennal article concave in *dzhalitae*, convex in *cupreus*; tarsi II on hind leg as long as basitarsi in *dzhalitae*, only half as long in *cupreus*, and S IV entire in *dzhalitae*, deeply emarginate in *cupreus*.

Period of flight and distribution (fig. 99). – The species occurs in August and probably is endemic to the Crimea.

Discussion. – In view of the extensive original description and the full account by Zimina (1989) it seems clear that *dzhalitae* is a distinct species. The description of the recently collected material by Zimina (1989) matches the original description on all significant points. *M. dzhalitae* has been tentatively assigned to the *clavipes* group on account of its external similarities with e.g. *clavipes* and *cupreus*.

Merodon hamifer Sack (figs. 49 a-b, 88)

Merodon hamifer Sack, 1913a: 436. Lectotype ♂ (here designated): 'Anatolien Ak-chehir [Akşehir] Korb 1900/ Mer. hamifer Sack det. Sack/ coll. Lichtwardt/ coll. D. E. I. Eberswalde' (DEIC) [examined].

Merodon hamifer; Paramonov 1926b: 322; Paramonov 1927: 78; Peck 1988: 171.

Lampetia hamifera; Sack 1931: 318.

Material examined. – Greece: 1♂ 'Samos, Ampelos 22.vi.1932, Werner' (NHMW); Turkey: Paralectotype ♀, same data as lectotype.

Description

M. hamifer is similar to *aberrans* except in the following details.

Male. – Head: Antennal ratio 2.0; antennae all orange. Thorax: Pubescence less dense. Legs: All tibiae and tarsi orange, tibiae 3 basally brown; femora 3 bearing modified triangular processus, basitarsi 3 showing apical projection on medial face. Genitalia: Pubescence on posterior surstyle lobe denser.

Body length 13.5–14.5 mm.

Female. – Except for sexual dimorphism, differing

from the male as follows. Head: Compound eyes separate, frons lustrous, slightly dulled down sides; antennae orange, antennal ratio 2.8. Legs: Similar to those of *hamifer* male, triangular processus slightly smaller. Abdomen: Pruinose bands wider; tergite V narrower.

Body length 14 mm.

Diagnosis. – This close relative of *aberrans* can be distinguished from all other species by the shape of the triangular processus in both sexes.

Period of flight and distribution (fig. 88). – *M. hamifer* occurs in the Greek Aegean islands and western Turkey, where it flies in June.

Merodon karadaghensis Zimina

Merodon karadaghensis Zimina, 1989: 24. Holotype ♂: 'Karadagh, Crimea, 5. ix. 1984, leg. Zimina'. Moscow Zoological Institute [not examined].

It appears that this species may be related to *M. dzhalitae*, with which it is compared by Zimina (1989). The differences are stated to be in the relative length of the tarsal joints, the outline of the triangular processus on the hind femora, while the abdominal pruinose bands also slightly differ.

Diagnosis. – After Zimina (1989), *M. karadaghensis* may be distinguished from *M. dzhalitae* by the length ratio of the basal tarsal joints (II:I) on tarsus 3, which is about 0.5 in *karadaghensis* and 0.8 in *dzhalitae*, and also by the abdominal pruinose band on T IV being chevron-shaped in *karadaghensis* while this is more rounded in *dzhalitae*.

Discussion. – This species is provisionally regarded as belonging to the *clavipes* group, on the grounds of resemblance to *M. dzhalitae*.

Merodon lusitanicus sp. n. (figs. 50 a, 93)

Type-material. – ♀ Holotype 'Portugal, Algarve, Quarteira 27.iv.1985, J. A. W. Lucas' (ZMAN); paratype ♀, same data, but locality: 'Vilamoura' (JLR).

Description

Female. – Head: Antennae black, antenna 3 with upper margin concave, apex rounded, antennal ratio 2.8; pubescence white on face, black on frons and vertex, pale brown on occiput; frontal sides whitish pruinose, leaving lustrous midstripe on median one-third; ocellar angle 60°.

Thorax: Dark, dorsum with 4 vague pruinose

bands and yellow pubescence; pubescence duller on scutellum and sides, katapisternum, anepisternum and anepimeron steel grey lustrous. Wings clear; halteres, squamae and antisquamae yellow.

Legs: All dark, joints lighter; femora 3 extremely swollen for a female, triangular processus showing strongly serrate distal margin bearing 10 bristles.

Abdomen: Dark with some purplish lustre, triangular in outline, with clear lateral spots on T II combined with dense erect white pubescence; pubescence otherwise sparse; T II-IV bearing rather narrow, conspicuous widely interrupted somewhat arcuate pruinose bands; T V acute, all dark.

Body length 11-12 mm.

Male. – Unknown.

Diagnosis. – *M. lusitanicus* can be separated from *aberrans* by the lateral spots on T II and the swollen femora 3; *lusitanicus* is too dark to be confused with females of *avidus*, *nigritarsis* or *distinctus*; its habitus can be compared with that of *alexeji* from which it differs in larger size, longer antennae and more swollen femora 3.

Period of flight and distribution (fig. 93). – This species, known only from the types, has been found in Portugal in April.

Discussion. – In view of the shape, width and position of the abdominal pruinose bands, relative baldness of the abdomen with purplish lustre, and general habitus, *lusitanicus* is provisionally regarded as closely related to *aberrans*, and therefore assigned to the *clavipes* group.

Etymology. – The adjective *lusitanicus* refers to the classical name for Portugal, Lusitania.

Merodon quadrinotatus (Sack) (figs. 51, 85)

Lampetia quadrinotata Sack, 1931: 324. Holotype ♀: 'Mesopotamia' [Iraq] [not examined, considered lost].

Merodon quadrinotatus; Peck 1988: 173.

Material examined. – Turkey: 1 ♀ 'Hakkari, Suvarihalil Pass W side 2300-2400 m 11.viii.1983 leg. J. A. W. Lucas' (ZMAN).

Description

Female. – Similar to the female of *clavipes*, but with the following differences. Head: Frons much tapering posteriorly, laterally whitish pruinose leaving a lustrous midstripe occupying a quarter of the width; pubescence white, but grey on occiput. Thorax: Grey pubescence on dorsum, with conspicuous black inter-

alar band. Legs: Pubescence grey to black, background colour deep black.

Abdomen: Black, pubescence dense and black throughout but with two pairs of very conspicuous white spots, one each on T III-IV, and weak latero-posterior triangular spots of grey pubescence on same tergites.

Body length 14 mm.

Diagnosis. – The dense black, white-dotted pubescence of the abdomen is unique and at once separates *quadrinotatus* from all other species currently known.

Period of flight and distribution (fig. 85). – The species is known from 'Mesopotamia' [Iraq] (month not reported by Sack) and the eastern Turkish mountains where it was collected in August.

Discussion. – Sack (1931) did not indicate a depository of the holotype. He did provide a reasonably clear description of *quadrinotatus*. Given the unique features of the species the identification of the Turkish specimen is unquestionable. Since *quadrinotatus* is believed to be a close relative of *clavipes* the species is assigned to the *clavipes* group.

Merodon splendens sp. n. (fig. 47 d, 91)

Type-material. – ♂ Holotype 'Sardaigne St. Ussassai 16.v.1977 P. Goeldlin' (LAU).

Description

Male. – Head: Antennae blackish, antennae 3 rounded-subacute, upper margin about straight, vertex angle 30°, ocellar angle 40°, tl-v ratio 0.4; pubescence pale yellow, face greenish lustrous, yellow pruinose; slight dark tuft present in ocellar region; oral margin weakly protruding.

Thorax: Dorsum and sides dark, weakly bluish lustrous on anepisternum, katapisternum and anepimeron; pubescence moderately dense, erect, pale yellow, with dark interalar band; no pruinose bands present. Wings clear, halteres, squama and antisquama pale yellow.

Legs: Black, with yellow pubescence; trochanters 3 with curved low chisel-edge; femora 3 very much swollen, with some oily lustre, curved.

Abdomen: T II strongly tapering, T III-IV cylindrical. Lateral spots on T II weak, micaceous; pruinose bands on T II-IV very clear, interrupted, arcuate; pubescence moderately dense, yellow on T II, deep orange on T III-IV.

Genitalia: Anterior surstyle lobe reniform, pubescent, although dense, so extremely short that it is inconspicuous; posterior surstyle lobe coalescent, much bulging outward anteriorly, rounded, with short,

erect, moderately dense pubescence. Cercus slightly protruding, bearing short, pale pubescence. Aedeagus slender, with smooth outer face, subapical cavity well marked, somewhat concave subbasally; fringed plates on thecal apex recumbent.

Body length 14.5 mm.

Female. – Unknown.

Diagnosis. – *M. splendens* is a close ally of *clavipes* and *velox*. From the latter it is distinguished by the clear wings. The differences with *clavipes*, apart from the smaller size, are: Antennae more slender, pubescence on head, thorax and abdomen less dense and shorter, T II more tapering, III-IV cylindrical. Differences with both species are: Anterior surstyle lobe more curving dorsad, differently shaped (cf. figs. 46 a and d), pubescence much less dense and very much shorter on anterior and posterior surstyle lobes and cercus. *M. splendens* can be distinguished from *cupreus* and *dzhaliata* by the swollen femora 3. The same character also separates *splendens* from *brevis*, to which it is slightly similar on account of its habitus. Moreover, the anterior surstyle lobe is quite differently shaped in *brevis*. It differs from *aberrans* by the strongly swollen femora 3 and denser pubescence.

Period of flight and distribution (fig. 91). – *M. splendens* is known only from the holotype, collected in Sardinia, in May.

Etymology. – The adjective *splendens* is latin and means splendid or beautiful. It was given in view of the colourful pubescence of this species.

Merodon velox Loew (figs. 47 a-c, 91)

Merodon velox Loew, 1869: 253. Lectotype ♂ (here designated): 'Rhodus/ Alte Sammlung' (NHMW) [examined].

Merodon velox var. *anathema* Paramonov, 1925: 149. Holotype ♀: 'Mons Takalta, prope Kulp, Transkaukasien' [in Turkey, approx. 38° 30' N, 41° 05' E] [not examined, probably lost].

Merodon velox var. *armeniacus* Paramonov, 1925: 147. Syntypes: 12 ♂ and 1 ♀ 'Eriwan' and 'Ordubad (Erivan)' [Armenia] [not examined, probably lost].

Merodon velox; Sack 1913a: 434; Paramonov 1925: 147; Paramonov 1926a: 15; Peck 1988: 175.

Merodon velox var. *anathema*; Liepa 1969: 20.

Merodon velox var. *anathemus*; Peck 1988: 175.

Merodon velox var. *armeniacus*; Liepa 1969: 20; Peck 1988: 175.

Lampetia velox; Sack 1931: 331.

Material examined. – Greece: ♀ Paralectotype with same label as lectotype; 100 ♂, 73 ♀ (BMNH, NHMW, RMNH, ZMAN, JLR, WH); Italy: 2 ♂, 1 ♀ (NHMW); Turkey: 16 ♂ and 3 ♀ paralectotypes 'As. Minor/ Alte Sammlung' (NHMW);

49 ♂, 37 ♀ (MNHN, RMNH, NHMW, BMNH, JLR); U. S. S. R.: 3 ♂, 1 ♀ (NHMW, RMNH); Yugoslavia: 2 ♂, 3 ♀ (NHMW).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin concave, apex subacute, antennal ratio 1.8; pubescence pale yellow, with few dark hairs in ocellar region; face and occiput densely white to yellow pruinose; vertex angle 40°, ocellar angle 70°. to 85°, tl-v ratio 0.5.

Thorax: Dark, lateral dorsum and scutellum, katepisternum, anepisternum and anepimeron weakly blue lustrous; pubescence rather dense, erect, brownish, dark interalar band present. Wings strongly infuscate, except apical-posterior margin; halteres, squamae and antisquamae yellow.

Legs: All dark, with yellow pubescence; trochanter 3 sharply ridged, femur 3 strongly swollen, triangular processus normally shaped, tibiae 3 and tarsi 3 normal;

Abdomen: Rather slender; all dark; T II tapering, bearing vague pale orange lateral spots, T II-IV with widely interrupted arcuate whitish pruinose bands, pubescence moderately dense, orange; S IV vaulted, posteriorly deeply, widely emarginate.

Genitalia: Completely similar to those of *clavipes*.

Body length 17-23 mm.

Female. – Except for the rather marked sexual dimorphism, differing from the male as follows. Head: Frons with lustrous midstripe occupying one-third of width, laterally white pruinose. Thorax: Inconspicuous longitudinal pruinose bands present, pubescence brown to grey throughout; no interalar band; wings less infuscate, strongest on surface bordering veins. Legs: The trochanter 3 smooth, femur 3 slenderer than in ♂ but still much swollen, pubescence duller. Abdomen: Pruinosity bands conspicuous, stronger arcuate, less interrupted, rather variable between specimens; pubescence almost restricted to T II where dense; lateral spots clearer.

Body length 17-18 mm.

Diagnosis. – *M. velox* is easily distinguished by the infuscate wings in the male; in the female it could be confused with *clavipes* and *pruni* from which it is distinguished by the veins bordered with infuscation (in *clavipes* wings clear; in *pruni* wings more evenly troubled), from *pruni* also by the all dark legs, less slender, much darker coloured abdomen and larger size. Moreover, in *pruni* the genitalia are quite different.

Period of flight and distribution (fig. 90). – *M. velox* occurs in the eastern Mediterranean where the imagines are found from May through August; the species may be bivoltine.

Biology. – The males of *velox*, observed by the author in May of 1984 in several Greek localities, were flying close to the soil on rather dry sunny hillsides with short vegetation.

Discussion. – Although the similarity of the genitalia with respect to *clavipes* is clear, the following arguments against synonymizing *velox* can be listed: (1) there are clear external differences; (2) the distribution of *velox* is quite restricted and purely Mediterranean, whereas *clavipes* occurs over all of southern and central Europe; (3) the flight period of *velox* is more restricted; (4) there is some evidence that *velox*, where it occurs together with *clavipes*, prefers more open, drier biotopes (author's observations; J. Lucas, pers. comm.); therefore, the ecological niches might be different; (5) behavioural differences seem to exist. When the *velox* males were observed in Greece, they did not show territorial behaviour. Males of *clavipes* observed at the same locality and date displayed territorial behaviour (cf. Hurkmans, 1988). This may indicate that either *velox* shows no territorial behaviour, or this behaviour takes place in a different period of the season.

Merodon velox var. *anathemus* Paramonov

Material examined. – Greece: 1 ♀ (WH); Turkey: 1 ♀ (WH).

Diagnosis. – Completely similar to the nominate form, except for the all dark pubescence. Only females are known.

Merodon velox var. *armeniacus* Paramonov

Material examined. – Turkey: 1 ♀ (WH)

Diagnosis. – Completely similar to the nominate form except in the abdomen where lateral spots are lacking and pruinose bands are reduced, in both sexes.

Discussion. – No recent male material is known; of the syntypes, all but one were males. Possibly some of the material might be present in the collection of the Museum of Armenia, Erivan.

Merodon warnckei sp. n. (figs. 52 a-d, 88)

Type-material. – ♂ Holotype 'Turkey, Hakkari, 5.viii.1983, Gavaruk-lake Mt. Sat, 2900 m, leg. Warncke' [37° 20' N, 43° 35' E] (ZMAN). Paratypes: 4 ♂, 1 ♀; 1 ♂ 'Turkey, Hakkari, Sat Mountains north of Mt. Gavaruk

2900 m, 7.viii.1983 leg. Warncke' (JLR); 2 ♂, 1 ♀ 'Turkey, Hakkari, Sat Mountains, south of Sat Lake, 2800 m, 7.viii.1983, leg. Warncke' (JLR); 1 ♂ 'Turkey, Van, Mengene Dag north of Başkale, 2700-3000 m, 27/28.vi.1986, leg. Hurkmans' (WH).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin convex, apax acute, antennal ratio 2.0; pubescence yellow throughout, pruinosity slight on face, dense on occiput; face strongly blue lustrous, occiput greenish lustrous; vertex angle 25°, ocellar angle 60°, tl-v ratio 0.3.

Thorax: Dark, greenish to blue lustrous on lateral dorsum and scutellum, katepisternum, anepisternum and anepimeron; slightly pruinose on sides; pubescence rather even, moderately dense, dull yellow. Wings slightly tinged; halteres, squamae and anti-squamae yellow.

Legs: Dark except joints on legs 1-2, leg 3 all dark; trochanters 3 smooth, femora 3 bluish lustrous, swollen, with normally shaped triangular process bearing 6-9 bristles; tarsi 3 normally shaped; pubescence yellow.

Abdomen: All tergites dark with some micaceous purple lustre; vague lateral pruinose spots present on T II; T II-IV with arcuate widely interrupted moderately wide yellowish pruinose bands; pubescence dull yellow, moderately dense throughout; S IV shallowly emarginate posteriorly, rather flat.

Genitalia: The anterior surstyle lobe very large, rather stalked, bearing dense, even, yellow pubescence apically, coalescent with posterior surstyle lobe; the latter with anterior low elongate projection bearing yellow, rather dense pubescence, posteriorly with long, dense, yellow pubescence. Cercus rather large, showing dense, very long, yellow pubescence. Aedeagus moderately slender, slightly widening apically, apical shaft part short, fringed plates on thecal apex recumbent.

Body length 14-15 mm.

Female. – Except for the conspicuous sexual dimorphism, differing from the male as follows. Head: Lustrous midstripe on frons occupying one-third of width; slight dark hair-tuft in ocellar region; face weakly lustrous, apex of antenna 3 subacute; pubescence grey. Thorax: Pruinosity bands on dorsum more distinct; pubescence greyish yellow. Legs: With grey pubescence. Abdomen: Pruinosity more extensive on T II, weaker on T III-IV; pubescence grey, less dense than in male; lustre weaker; T V tapering, apex rounded.

Body length 14 mm.

Diagnosis. – *M. warnckei* males can be distinguished from those of other species in this group by

its relatively stout build, the stalked anterior surstyle lobe and the strong metallic lustre of the face; the females of *warneckei* are stouter and smaller, and have less swollen femora 3 than *clavipes* or *velox*, are much stouter than *pruni* or the species in e.g. the *avidus* and *alagozeicus* groups from which they differ as well in having much less conspicuous pruinose bands.

Period of flight and distribution (fig. 88). – The species is known from eastern Turkey; it has been collected in high altitudes only, where it occurs in June and August; in view of the few specimens collected, the split occurrence does not necessarily indicate that *warneckei* is bivoltine.

Etymology. – The species has been named after the German entomologist K. Warncke, who collected the holotype and most paratypes. A noun in genitive case.

The *pruni* group

Apomorphies: The ♂ genitalia with surstyle sulcate; vertex angle very small; yellow coloration on abdomen extensive.

Merodon pruni (Rossi) (figs. 53 a-d, 94)

Syrphus pruni Rossi, 1790: 293. Syntypes: 'in provinciis Florentina et Pisana' [Toscana, Italy] [not examined].

Merodon pruni var. *obscurus* Gil Collado, 1929: 407. Holotype ♂: 'Tanger, Mz. Escalera/ M. pruni var. obscurus Gil Tipo, Gil Collado det./ M. N. C. N. Madrid' (IEE) [examined].

Merodon fulvus Macquart, 1834: 514. Syntypes 'France Méridionale' [not examined].

Merodon fuscinerius Von Röder, 1887: 73. Syntypes: 'bei Elos [Elous, 35° 20' N, 23° 36' E] in der Nahe von Kisamos auf der Insel Kreta' [not examined].

Merodon pallidus Macquart, 1842: 70. Lectotype ♂ (here designated): 'Baghdad' [examined].

Merodon sicanus Rondani, 1845: 258, 264. Lectotype ♀ (here designated): '58' [number referring to description of *M. sicanus* in catalogue by Rondani] [examined].

Merodon pruni, Schiner 1857: 415; Bezzi 1900: 90; Becker 1912: 602; Sack 1913a: 434; Paramonov 1925: 152; Paramonov 1926a: 15; Hurkmans 1985: 69.

Merodon pruni var. *obscurus*, Peck 1988: 173.

Lampetia pruni, Sack 1931: 323; Séguy 1961: 181; Van der Goot 1964a: 431.

Merodon pallidus, Brunetti 1923: 217.

Lampetia pallida, Sack 1931: 323.

Merodon sicanus, Rondani 1857: 55, 65; Schiner 1857: 411; Schiner 1862: 347; Palma 1863: 46; Strobl 1893: 76; Strobl 1900: 593.

Lampetia sicana, Sack 1931: 323.

Material examined. – Algeria: 6♂, 2♀ (BMNH, MNHN); Cyprus: 10♂, 10♀ (BMNH, NHMW, KBIN); France: 1♂, 1♀ (MNHN); Greece: 23♂, 11♀ (MNHN, NHMW, BMNH, JLR,

Den Hollander, WH); Iran: ♀ paralectotype of *pallidus*: 'Baghdad' (MNHN); 1♂, 1♀ (RMNH); Italy: ♀ paralectotype of *sicanus*: '58'; 79♂, 32♀ (BMNH, NHMW, ZMAN, RMNH, JLR, WH); Israel: 16♂, 11♀ (KBIN, NHMW, MNHN, NHMW, BMNH); Lybia: 6♂, 7♀ (BMNH); Morocco: 5♂ (MNHN, RMNH); Pakistan: 11♂, 10♀ (BMNH); Syria: 1♂ (NHMW); Turkey: 8♂, 14♀ (JLR, ZMUC, MNHN).

Description

Male. – Head: Antennae brown to orange, antenna 3 with upper margin convex, apex subacute, antennal ratio 1.4; pubescence yellowish, darker in ocellar region; face and occiput rather densely pale yellow pruinose, weakly blue metallic lustrous; vertex angle 25°, ocellar angle 35°, tl-v ratio 0.4.

Thorax: Dark; katepisternum, anepisternum and anepimeron weakly blue lustrous; pubescence on dorsum and scutellum rather short, very even, yellow, in some specimens with more or less clear interalar band and/ or with more or less vague pruinose longitudinal bands; pubescence on sides concolorous, less even. Wings troubled, strongest in antero-basal portion; halteres, squamae and antisquamae pale yellow.

Legs: The femora dark with yellow apices, tibiae yellow with broad dark distal band, tarsi 1 and 2 yellow, tarsi 3 dark with striking golden pubescence on sides contrasting dark upper face; trochanters 3 bearing acute projection, femora 3 strongly swollen, bearing much projecting triangular processus holding 6-9 bristles on serrate distal margin; all tarsi normal.

Abdomen: Rather slender; T II strongly tapering, with large yellow lateral spots; background colour dark brown, but in most specimens replaced with yellow to a large extent, in some specimens yellow throughout; pruinose bands pale yellow, arcuate, incomplete on T II, wide and hardly interrupted on T III-IV where they may occupy most of the tergite surface; pubescence rather dense, predominantly yellow, longest laterally; sternites yellow, S I-II pale, III-IV darker, the latter strongly vaulted, deeply, narrowly emarginate posteriorly.

Genitalia: Anterior surstyle lobe rounded, bearing short, erect, yellowish pubescence throughout except basally; separated from posterior surstyle lobe by shallow sulcus; posterior surstyle lobe bearing long, uneven, erect, yellow pubescence. Cercus conspicuous, wide, with long, dense, yellow pubescence, somewhat angular. Aedeagus rather short, moderately slender, apical shaft part short, fringed plates on thecal apex recumbent.

Body length 8-23 mm.

Female. – Very similar to the male. Except for sexual dimorphism, differing as follows. Head: Frons with lustrous midstripe occupying less than 0.2 of frontal width; ocellar angle 45°. Thorax: Narrower than in male; Pruinose bands often vaguely present

on dorsum; wings stronger infusate. Legs: Femora 3 less swollen, but strongly swollen compared with females of other species of *Merodon*; trochanters 3 smooth. Abdomen: Pruinose bands wider medially, narrower laterally compared with males; T V tapering, all dark.

Body length 10-21 mm.

Variation. – *Merodon pruni* shows an immense variation in size, which does not seem to be correlated with locality or flight period. The specimens assigned to *pruni* can be arranged in a continuous series; the expression of several characters seems to be correlated with specimen size, e.g. relative size of projection on trochanters 3 and triangular processus. This phenomenon is also found in other species, most strongly in *kawamurae*. The differences between specimens may be the consequence of differing food availability in the larval stage.

Diagnosis. – The usual size in both sexes (normal range 17-21 mm) and predominantly yellow abdomen combined will distinguish *pruni* from all other species except *clavipes* and *velox*; from these two the males are easily distinguished by the more slender abdomen with less dense pubescence, moreover from *velox* by the absence of deep infuscation on wings; the females of *pruni* are paler and have more slender abdomina than those of *clavipes* and *velox*. Small specimens can be distinguished from other *Merodon*, in the males by the nearly all yellow abdomen and the genitalia; the dwarf females may cause some problems but can be distinguished by their triangular yellow abdomina and darkened wings. In *pruni* females of all sizes the darkening of the wings is black, without purple reflections.

Period of flight and distribution (fig. 94). – *M. pruni* has been recorded by Sack (1931: 324) to fly from May to August in southern Europe, north Africa and Asia Minor. The species is common in Toscana, Italy and in central Greece. From the specimens in collections it appears that *pruni* may be bivoltine at least in Italy and Greece. *M. pruni* seems to be rare in southern France and absent from Spain.

Biology. – *M. pruni* occurs in rather open habitats with scattered tall plants, mainly Umbelliferae and Liliaceae, on hillsides exposed to the sun (Hurkmans 1985); the males are territorial and aggressively expel invaders; the females are much less conspicuous in the field than the males as they fly close to ground level (Hurkmans 1985). This difference in flight behaviour might explain the sex ratio found among preserved material in museum collections studied, which is about 1.7 males to a female.

Discussion. – Type-material of *fulvus* Macquart, 1834 and *fuscinervis* Von Röder, 1887 could not be examined. To judge from the descriptions both taxa seem to fall well within the variation range of *pruni*. The synonymy with *pruni* was already given by Sack (1913a, 1931) and Peck (1988).

Merodon pruni var. *obscurus* Gil Collado

Diagnosis. – Rather similar to the nominal form, except for the following differences in the male (females unknown). Head: Antennae 3 dark brown [not black as indicated in description], truncate. Thorax: Pubescence very short, even, yellow, but darker in middle of dorsum, transition gradual; no pruinose bands present. Wings darkened along anterior margin, the brown veins bordered with slight infuscation.

Body length 18 mm.

The *longicornis* group

Apomorphies: Extreme lengthening of antenna 3; male genitalia with surstyle deeply sulcate and very slender aedeagus; vertex angle very small.

Description. – Head: Antennae 3 with upper margin straight, apex subacute to rounded, antennal ratio 2.2 to 4.8; vertex angle 25° to 30° in males, ocellar angle some 35° in males, 60° in females; in females lustrous midstripe on frons occupying 0.35 to 0.6 of width. Thorax: Dark, rather narrow, bearing 4 longitudinal, mostly clear pruinose bands. Wings clear. Legs: All dark, sometimes joints paler, trochanters 3 smooth, femora 3, triangular processus and basitarsi 3 normally shaped.

Abdomen: Rather slender; T II somewhat tapering, T III-IV cylindrical in male, tapering in female; in *erivanicus* and *longicornis* dark background coloration partially replaced by crimson red colour typical of this group; pruinose bands narrow, arcuate and conspicuous. Genitalia: Anterior surstyle lobe quadrate to rectangular, anteriorly showing dense, yellow pubescence, separated from posterior surstyle lobe by deep sulcus, stalked; the posterior surstyle lobe low, short to elongate. Cercus well protruding. Aedeagus very slender, fringed plates on thecal apex recumbent to oblique.

Body length in both sexes 9-13 mm.

Merodon erivanicus Paramonov (figs. 54 a-b, 55 a, 92)

Merodon erivanicus Paramonov, 1925: 151. Syntypes: 'Erivan, Armenien' [not examined].

Merodon erivanicus, Liepa 1969: 20; Peck 1988: 170.

Lampetia erivanica; Sack 1931: 315; Sack 1938: 22.

Material examined. – Greece: 2 ♀ (NHMW); Israel: 1 ♀ (BMNH); Turkey: 19 ♀ (BMNH, JLR, WHI); Yugoslavia: 1 ♀ (NHMW).

Description

Female. – Head: Antennae dark brown, antenna 3 with upper margin convex to straight, apex obtuse, antennal ratio 2.2 to 2.8; ocellar angle 60°, pubescence yellow, face and occiput with slight metallic lustre obliterated by dense whitish pruinosity; frons densely pruinose laterally, midstripe occupying 0.4 of width.

Thorax: Dark, dorsum with well marked pruinose bands, pubescence greyish yellow, short, dense, even; katepisternum, anepisternum and anepimeron greenish to bluish metallic lustrous, hardly pruinose, pubescence concolorous. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: Dark, tibiae 1 and 2 basally yellow; dense yellow pubescence on sides of tarsi, contrasting dark pubescence on upper faces; trochanters 3 smooth, femora 3 slightly swollen, triangular process normal.

Abdomen: Slender, dark coloration partially replaced by crimson; the extent of the crimson colour is much variable between specimens; T II-IV with interrupted arcuate white pruinose bands; pubescence very short, inconspicuous, black on dark surface, yellowish on crimson surface; S I-II red, III-IV dark red to black.

Body length 10-12 mm.

Male. – Unknown.

Diagnosis. – *M. erivanicus* is distinguished from females of other *Merodon* species by the long antenna 3 and crimson colour on the abdomen; from *longicornis* by the shorter antenna 3 (antennal ratio in *longicornis* is 4.1 to 4.8).

Period of flight and distribution (fig. 92). – *M. erivanicus* occurs in June and July, in the eastern Mediterranean, in eastern Turkey and Armenia.

Merodon kaloceros sp. n.
(figs. 54 d, 55 c, 56 a-c, 87)

Type-material. – ♂ Holotype 'Turkey, Antalya, H. Coene, J. Lucas & B. van Oorschot / Irnesan Gedigi 12 km N of Akseki 1600 m 24.vii.1981' (ZMAN). Paratypes: 24 ♂, 1 ♀: 1 ♀, same data as holotype (JLR); 4 ♂ 'Turkey, Hakkari, Suvarihalil pass 1250 m, W side near Habul Deresi 13.vi.1984 leg. J. A. W. Lucas' (JLR); 2 ♂ 'Turkey Hakkari, Chilo Dagları N of Oramar 1400 m, 16/17.vi.1984, leg. J. A. W. Lucas' (JLR); 2 ♂ 'Turkey, Hakkari, Sat Dag, SW Yüksekova 1600 m 18.vi.1984 J. A. W. Lucas' (JLR); 8 ♂ 'Turkey pr. Hakkari, Sat Dag, Varegös SW Yüksekova 28. and 29. vi.1985' (JLR); 1 ♂ 'Turkey, Van, 40 km SW

Akdamar 1720 m, 17.vii.1986, leg. P. van Ooijen' (ZMAN); 1 ♂ 'Dalmatien [Yugoslavia], Gravosa vi.28 [1928] Zerny' (NHMW); 1 ♂ 'Greece, Ithaca 6/11.vi.1965 F. J. Francois' (KBIN); 2 ♂ 'Hill Scrub 500 ft above lake/ Macedonia Prespa geul Otesevo 20/27.vi.1958/ Yugoslavia R. L. Coe' (BMNH); 1 ♂ 'Yugoslavia Kroatie Bribir (50 100) 10.viii.1964 H. J. P. Lambeck' (JLR); 1 ♂ 'Corfu, Erber 218' [Greece] (JLR).

Description

Male. – Head: Antennae dark, antenna 3 brown with base and apex paler, upper margin straight to convex, apex subacute to obtuse, antennal ratio 2.3 to 2.7; pubescence greyish yellow with dark tuft in ocellar region; vertex angle 25-30°, ocellar angle 40°, tl-v ratio 0.55.

Thorax: Dark, dorsum with inconspicuous pruinose bands, katepisternum, anepisternum and anepimeron blue to green metallic lustrous; pubescence yellowish, rather even and short on dorsum and scutellum, longer, uneven on sides. Wings clear; halteres, squamae and antisquamae yellow.

Legs: Dark, tarsi with contrasting golden pubescence on sides and dark upper faces; trochanters 3 smooth, femora 3 slightly swollen, triangular process normally shaped, distal margin much serrate; tibiae 3 and tarsi 3 normal.

Abdomen: Dark, slender, with conspicuous orange lateral spots on T II; T II-IV showing white conspicuous narrowly interrupted arcuate pruinose bands; pubescence concolorous with surface, yellow on lateral spots; S brown, S IV darkest, flat, posterior margin entire.

Genitalia: Anterior surstyle lobe large, more or less rectangular, rounded anteriorly, on margin with dense, yellow, even pubescence; the posterior surstyle lobe separated by deep sulcus, rather short, low, somewhat angular, showing dense, uneven, yellow pubescence. Cercus rather short, wide, with dense yellow pubescence. Aedeagus bearing paired humps basally on outer face, apical shaft part short, fringed plates on thecal apex recumbent to oblique.

Body length 13 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Frons with lustrous midstripe occupying 0.3 of width. Thorax: Pruinosity bands more conspicuous; pubescence denser, grey, even as if shaven. Legs: Pubescence greyish throughout. Abdomen: Outline more triangular; pubescence denser, greyish; pruinose bands wider, continuous; lateral spots extended over all of T II and anterior margin of T III; T V tapering, dark, with grey pubescence.

Body length 13 mm.

Diagnosis. – *M. kaloceros* can be distinguished from other *Merodon* except *erivanicus* and *longicornis* by the large antennal ratio and structure of the male

genitalia; it is distinguished from the two species mentioned by the coloration on the abdomen which is orange in *kaloceros* but crimson in *erivanicus* and *longicornis*.

Period of flight and distribution (fig. 87). – *M. kaloceros* occurs in the eastern Mediterranean region and Turkey in June through August. Given the collection dates from eastern Turkey, where most of the type material was collected, the species is univoltine.

Discussion. – In view of apomorphies shared with *longicornis*, e.g. the shape of the ♂ genitalia and large antennal ratio, *kaloceros* is assigned to the *longicornis* group.

Etymology. – The epitheton *kaloceros* is derived from the greek words kalon, meaning good, beautiful, and ceros, meaning horn; it refers to the large antennae (not as extremely long as in *longicornis*). The epitheton is to be treated as a noun in apposition.

Merodon longicornis Sack (figs. 54 c, 55 b, 57 a-c, 93)

Merodon longicornis Sack, 1913a: 447. Lectotype ♀ (here designated): 'longicornis det. Sack/ Merodon longicornis Sack Type Turkestan/ longicornis det. Hermann' (NHMW) [examined].

Merodon longicornis; Paramonov 1925: 154, 1926a: 15; Van der Goot 1981: 214, 218; Peck 1988: 171.

Lampetia longicornis; Sack 1931: 320.

Material examined. – Greece: 2♂, 25♀ (KBIN, JLR, Coll. Thessaloniki, ZMAN, BMNH, NHMW); Italy: 30♂, 24♀ (RMNH, JLR, ZMAN); Israel: 1♀ (RMNH); Morocco: 1♀ (BMNH, doubtful); Syria: 1♀ (KBIN); Turkey: 16♂, 24♀ (BMNH, JLR, NHMW); Yugoslavia: 4♀ (BMNH, RMNH).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin rather straight, apex rounded, antennal ratio 4.1 to 4.8; pubescence pale yellow, dark in large ocellar region; ocelli placed far forward; pruinosity on face and occiput dense, whitish; vertex angle 30°, ocellar angle 35°; tl-v ratio 0.3.

Thorax: Dark; dorsum with pruinose bands, pubescence rather sparse, even, moderately long; surface of katapisternum, anepisternum and anepimeron weakly lustrous, with some silky lustre produced by yellow recumbent pubescence. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: Dark, joints paler in specimens; trochanters 3 smooth, femora 3 rather strongly swollen, straight; triangular processus and tarsi normally shaped.

Abdomen: Dark; moderately slender; T II tapering; T II-IV showing conspicuous slightly arcuate white narrow pruinose bands; pubescence concolor-

ous with surface; S IV moderately vaulted, posteriorly narrowly emarginate.

Genitalia: The anterior surstyle lobe rather rectangular, with short, even, yellow pubescence, separated from the rather long, low posterior surstyle lobe by a deep sulcus; the posterior surstyle lobe posteriorly bearing moderately long, yellow, uneven pubescence, its lateral face with several ridges and furrows. Cercus rather large, well protruding, showing long, dense, slightly wavy, yellow pubescence. Aedeagus normally wide in ventral view, extremely slender in lateral view, apical shaft part short, fringed plates on thecal apex oblique.

Body length 9-10 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Lustrous midstripe on frons occupying 0.6 of width; pubescence dark on midstripe, grey laterally. Thorax: Pubescence shorter than in male. Legs: Yellow pubescence on basitarsi 3 found in some ♀. Abdomen: Strong crimson coloration always present in ♀, restricted to T II or extended over most of abdomen; T II more tapering than in male; T V acute, dark, scattered pale pubescence present.

Body length 9-10 mm.

Diagnosis. – The extremely large antennal ratio distinguishes *longicornis* from all other known species.

Period of flight and distribution (fig. 93). – The species occurs in May through July in the Mediterranean region, Turkey, Ukraine and southern Russia. It appears to be rare in the western, common in the eastern part of the range and in Turkey and adjacent areas.

The *vandergooti* group

Apomorphies: Lengthening of anterior surstyle lobe; extreme swelling of femora 3; extensive yellow coloration on legs.

Merodon vandergooti sp. n. (figs. 58 a-c, 88)

Type-material: ♂ Holotype 'Turkey, Hakkari, Suvarihalil pass 1250 m W side near Habul Deresi, 13.vi.1984 leg. J. A. W. Lucas' (ZMAN). Paratypes: 20♂; 18♂ with same data as holotype (16 JLR, 2 WH); 1♂ [Turkey] 'Ankara 650 m, 1.vi.1971 leg. Kl. Warncke' (JLR); 1♂ [Turkey] 'Ankara, South of Ankara, 24.vi.1984 leg. J. A. W. Lucas' (JLR).

Description

Male. – Head: Antennae conspicuously orange, antenna 3 with convex upper margin, apex acute, an-

tennial ratio 1.5 to 1.7; pubescence golden yellow, rather dense, producing silky lustre on frons; face blue metallic lustrous, moderately dense white pruinose; vertex angle 40°, ocellar angle 40°, tl-v ratio 0.4.

Thorax: Dark, with vestigial pruinose bands on dark dorsum; katapisternum, anepisternum and anepimeron weakly blue lustrous; pubescence golden on dorsum and scutellum, greyish-golden on sides; in many specimens some dark hairs present between wing insertions giving suggestion of vague intaralar band; posterior fringe of scutellum bearing dense yellow pubescence. Wings clear; halteres, squamae and antisquamae yellow.

Legs: Bases of femora 1 and 2 dark, femora 3 all dark, otherwise legs fiery orange throughout, with orange pubescence; trochanters 3 showing distinct ridge ending laterally in a low but marked hump; femora 3 enormously swollen, rather strongly curved; triangular processus large, bearing 10-13 delicate bristles on hardly serrate distal margin.

Abdomen: Dark; T II relatively large, tapering, bearing vague yellow lateral spots; T II-IV with oblique slightly arcuate, yellow pruinose bands, pubescence concolorous with surface; S IV moderately vaulted, narrowly and deeply emarginate posteriorly.

Genitalia: Anterior surstyle lobe moderately wide, much elongate, the anterior part showing dense yellow pubescence throughout, ventral margin similarly pubescent; separated from posterior surstyle lobe by deep wide sulcus; posterior surstyle lobe low, elongate, bearing dense, long, yellow pubescence on ventral and posterior margins; there is a secondary lateral lobe, bearing moderately long yellow pubescence. Cercus rounded, well protruding, with dense yellow pubescence. Aedeagus moderately slender with short apical shaft part and fringed plates on thecal apex recumbent.

Body length 13-14 mm.

Female. – Unknown

Diagnosis. – *M. vandergooti* is easily separated from other *Merodon* species by the structure of the genitalia and the enormously swollen femora 3; the colour pattern of the legs is very unusual as nearly all species with partially yellow legs have dark bands on the tibiae. The colour pattern on the legs and orange antennae are also found in *aureotibia* females. In *vandergooti* the antenna 3 is acute, in *aureotibia* obtuse; the abdominal pruinose bands are much more arcuate in *aureotibia*, where the triangular processus has a strongly serrate distal margin with 6-7 robust bristles; in *vandergooti* the triangular processus bears 10-13 fine bristles on a hardly serrate distal margin. These differences cannot be accounted for by explaining them as sexual dimorphism and are thus considered

valid distinctions on the species level.

Period of flight and distribution (fig. 88). – *M. vandergooti* occurs in June and has been found in central and south-eastern Turkey.

Etymology. – It is a pleasure to dedicate this species to Mr Volkert van der Goot who, over the last decades, has largely stimulated research work on Syrphidae in the Netherlands. A noun in genitive case.

The *nigritarsis* group

Apomorphies: Aedeagus with apical shaft part lengthened; two pairs of spines on outer face of aedeagus.

Description. – Head: Antennae dark, antennal ratio over 1.5, tl-v ratio about 0.4 in male; face bluish lustrous, strongest in male; in female, frons lustrous on median 0.25 of width. Thorax: Inconspicuous pruinose bands present; pubescence rather dense, short. Legs: Dark with yellow markings on tibiae, tarsi 1 and 2 in normal (not melanistic) specimens; trochanters 3 much variable between specimens, usually humped; golden pubescence on sides of tarsi 3 contrasting dark upper face. Abdomen: Moderately slender; T IV bulging in male; pruinose bands arcuate, clear; S IV in male strongly vaulted, deeply emarginate posteriorly. Genitalia: Anterior surstyle lobe elongate, stalked, diamond-shaped, posterior surstyle lobe elongate; aedeagus with 2 pairs of chitinous spines on outer face and lengthened apical shaft part.

Merodon femoratoides stat. nov.

(figs. 59 a-d, 95)

Merodon spinipes var. *femoratoides* Paramonov, 1925: 158.

Lectotype ♂ (here designated): 'Karadagh bei Theodosia, Krym, 3.vi.1919' (ZMHB) [examined].

Merodon spinipes var. *femoratoides*, Liepa 1969: 20; Peck 1988: 174.

Lampetia spinipes var. *femoratoides*; Sack 1931: 328.

Material examined. – Algeria: 1 ♂ (BMNH); Greece: 2 ♂, 1 ♀ (JLR); Turkey: 12 ♂ (JLR, BMNH, NHMW, WH); U. S. S. R.: 2 ♂ Paralectotypes of *spinipes* var. *femoratoides*, 'Warnutka, Sevastopol, Krym 11.vi.1923' (ZMHB); 1 ♂, Krym, Karadagh 24.vi.25 [1925] Paramonov leg./ Typus *Merodon spinipes* var. *femoratoides* ♂ / B. Kurodke Pinob [in Russian script] (ZMHB) [This specimen cannot be considered as a type specimen since it is not mentioned in the original publication].

Description

Male. – Head: Antennae dark, antenna 3 with upper margin concave, apex subacute, antennal ratio 1.5; pubescence yellow, face strongly white pruinose; ver-

tex angle 30°, ocellar angle 45°, tl-v ratio 0.4.

Thorax: Dark, with four clear pruinose bands and a fifth anteromedian fainter one; pubescence dark yellow, rather short, even; katapisternum, anepisternum and anepimeron blue lustrous. Wings slightly evenly troubled; halteres, squamae and antisquamae yellow.

Legs: The tibiae basally and femora apically orange, otherwise dark; trochanters 3 smooth, femora 3 moderately swollen, triangular processus bearing 6-10 strong bristles on moderately serrate distal margin; tibiae 3 bearing dense golden pubescence, tarsi 3 with same pubescence on sides, contrasting dark upper face.

Abdomen: Moderately slender; T II much tapering; T II-IV with arcuate off-white pruinose bands; T II bearing clear to almost absent yellow lateral spots which may extend over part of T III; pubescence concolorous with background; S IV vaulted, acutely, narrowly emarginate posteriorly up to half its length.

Genitalia: Anterior surstyle lobe elongate, clearly stalked, the apical portion triangular, anteriorly showing dense yellow pubescence; posterior surstyle lobe with small anterior, accessory lobe bearing dense, long, yellow pubescence; itself low and elongate, showing dense yellow pubescence posteriorly. Cercus inconspicuous and hidden between projecting posterior surstyle lobes. Aedeagus rather slender, bearing two pairs of spines on outer face, apical shaft part lengthened, fringed plates on thecal apex oblique.

Body length 13-15 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Frons lustrous on median one-third, whitish pruinose laterally. Thorax: Pubescence as if shaven, golden; four well marked pruinose bands present. Abdomen: T II tapering, lateral spots conspicuous, extended over part of T III; pruinose bands arcuate, widely interrupted and conspicuous.

Body length 12.5 mm.

Diagnosis. – *M. femoroides* may be easily distinguished from *avidus* by the very different genitalia in the ♂ and the contrast of hair colour on tarsi 3 in both sexes. The distinction with *nigritarsis* is in the differently shaped anterior surstyle lobe in the males and the less dark abdomen with larger lateral spots in the females.

Period of flight and distribution (fig. 95). – The species occurs in the Mediterranean, Asia Minor and southern Russia and Ukraine from May through July; its distribution range is large, but the species is uncommon.

Merodon nigritarsis Rondani (figs. 60 a-g, 97)

Merodon nigritarsis Rondani, 1845: 258, 264. Lectotype ♂ (here designated): '68/ Torino D. Ghiliani' in coll. Rondani (LSF) [the number 68 refers to the description of this species in Rondani's catalogue] [examined].

Merodon nigritarsis; Rondani 1857: 55, 65; Schiner 1857: 415; Rondani 1873: 295; Strobl 1893: 76; Bezzi 1895: 16; Strobl 1900: 91; Sack 1913a: 447; Paramonov 1925: 157, 1926a: 15; Gil Collado 1930: 254; Peck 1988: 174. *Lampetia nigritarsis*; Sack 1931: 327; Séguéy 1961: 177.

Material examined. – Austria: 4♂ (BMNH, NHMW, ZMUC); France: 96♂, 32♀ (MNHN, KBIN, RMNH, BMNH); Greece: 29♂, 19♀ (NHMW, ZMUC, den Hollander, KBIN, Bonn, ZMAN, RMNH, Thessaloniki, BMNH); Hungary: 2♂, 4♀ (RMNH, Bonn, ZMUC); Italy: 3♂, 3♀ paralectotypes, '68' in coll. Rondani (LSF); one ♀ paralectotype, '68/ Susa, D. Ghiliani' in coll. Rondani (LSF) and 13♂, 5♀ (LSF, KBIN, ZMAN, RMNH); Poland: 1♀ (BMNH); Spain: 9♂, 5♀ (MNHN, BMNH, JLR, NHMW); Turkey: 9♂, 6♀ (JLR, BMNH, NHMW, ZMAN, RMNH); Yugoslavia: 49♂, 19♀ (BMNH, NHMW, Bonn, ZMAN, RMNH).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin convex, apex subacute, antennal ratio 1.6; pubescence yellow with dark tuft in ocellar region; vertex angle 30°, ocellar angle 40°, tl-v ratio 0.4.

Thorax: Dark, lustrous on lateral dorsum, scutellum and sides, bearing rather dense yellow pubescence. Wings clear; halteres, squamae and antisquamae yellow.

Legs: All femora dark, paler apically; tibiae yellow with broad dark distal band; trochanters 3 with much variable hump, usually well marked, femora 3 slightly swollen, with normal triangular processus bearing 6-9 bristles on serrate distal margin; tibiae 3 and tarsi 3 normally shaped; the basitarsi 3 with strong contrast between dark pubescence on upper face and golden pubescence on sides; this is a characteristic that can be of use in the field as it is conspicuous to the naked eye at short range.

Abdomen: Dark; T II with orange to yellow lateral spots of variable size and clearness; T III in many specimens with yellow anterior lunules; T II-IV bearing arcuate, narrowly interrupted pruinose bands; S IV very deeply, narrowly emarginate, strongly vaulted.

Genitalia: Anterior surstyle lobe elongate, widened subapically, more or less rounded apically, with dense yellow even short pubescence there; posterior surstyle lobe separated by small sulcus; rather elongate, moderately high, posteriorly bearing dense, long, yellow pubescence. Cercus rather inconspicuous, rounded, pubescence as on posterior surstyle lobe. Aedeagus bearing two pairs of spines on outer face; apical shaft part clearly lengthened; fringed plates on thecal apex recumbent.

Body length 12-16 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Frons lustrous on median quarter, sides white pruinose, pubescence concolorous; dark tuft in ocellar region less clear than in male; ocellar angle 45 to 50°. Thorax: Shorter pubescence; pruinose bands clearer. Legs: Trochanters 3 always smooth.

Body length: 12-17 mm.

Variation. – *Merodon nigratarsis* is one of the more variable species of the genus; the hump on the trochanters 3 and the shape of the anterior surstyle lobe are notoriously variable between specimens, even those collected together at the same site. There are many local forms, each with their own peculiar aberrations, notably in the shape of the anterior surstyle lobe. Since a fluent, continuous series can be arranged using these specimens, I have refrained from describing local subspecies.

Diagnosis. – *M. nigratarsis* can be distinguished from other *Merodon* except *femoratoides* in the males by the general morphology of the genitalia and the spines on the aedeagus and the contrast on the basitarsi 3 in both sexes; from *femoratoides* it may be distinguished in the males by the differently shaped anterior surstyle lobe and basally convex aedeagus, smaller lateral spots and less wide interrupted pruinose bands; in the females by the darker abdomen.

Period of flight and distribution (fig. 97). – *M. nigratarsis* occurs in the Mediterranean and the southern parts of central Europe from May through August; possibly the species is bivoltine.

Discussion. – *M. nigratarsis* has been considered a variety or subspecies of *avidus*. In view of the completely different genitalia a close relation between *avidus* and *nigratarsis* is out of the question. *M. nigratarsis* was named for the dark basitarsi 3; however, this feature also occurs in other species externally resembling *nigratarsis*, such as *alagozicus* and its allies; the lengthened apical shaft part of the aedeagus is another shared feature.

The *avidus* group

Apomorphies: Anterior surstyle lobe anteriorly much widened; T II extremely tapering.

Merodon avidus (Rossi)

(figs. 61 a-g, 96)

Syrphus avidus Rossi, 1790: 292. Syntypes: 'in provinciis

Florentina et Pisana' [Toscana, Italy] [not examined].
Syrphus spinipes Fabricius, 1794: 296. Lectotype ♂ (here designated): 'spinipes' in coll. J. C. Fabricius (ZMUC) [seriously damaged] [examined].
Merodon serrulatus Wiedemann in Meigen, 1822: 360. Lectotype ♂: (here designated) 'Portugall coll. Winthem/serrulatus Wied.' (NHMW) [examined].
Merodon italicus Rondani, 1845: 257, 259. Lectotype ♀ (here designated): '67b' in coll. Rondani (LSF); the '67b' number refers to the description of *italicus* in Rondani's catalogue. [examined] syn. n.
Merodon rufitibius Rondani, 1845: 259, 265. Lectotype ♂ (here designated): '72' in coll. Rondani (LSF) [examined]; the '72' number refers to the description of *rufitibius* in Rondani's catalogue.
Merodon graecus Walker, 1852: 243. Lectotype ♀ (here designated): 'Albania/ graecus Walker' (BMNH) [examined].
Merodon aurifer Loew, 1862a: 83. Lectotype ♂ (here designated): 'Melatia [Malatya, Turkey] Erber/ coll. H. Loew/ Zool. Mus. Berlin'; on separate pin: '... *Merodon aurifer* n. Berl. Zeit. vi.1862 pg 82 ...' (ZMHB) [examined].
Merodon quadrilineatus Lioy, 1864: 473. [Type-material probably never existed. Lioy published only theoretical works and had no intention to describe new species.]
Merodon avidus, Rondani 1845: 259; Schiner 1857: 415; Strobl 1893: 76; Bezzi 1895: 16, 1900: 91; Strobl 1900: 593; Villeneuve 1903: 115; Gil Collado 1930: 254; Van der Goot 1971: 106, 1981: 216, 218; Barendregt 1982: 80; Marcos García 1985: 196; Bradescu 1986: 123; Peck 1988: 167; Hurkmans 1988: 107.
Lampetia avida, Séguéy 1961: 176; Van der Goot 1964a: 431.
Milesia spinipes, Latreille 1804: 331.
Merodon spinipes, Fabricius 1805: 197; Meigen 1822: 361; Macquart 1828: 295, 1834: 516, 1842: 70; Rondani 1845: 258, 264, 1857: 55, 66; Schiner 1857: 414; Strobl 1893: 76; Bezzi 1895: 16, 1900: 91; Strobl 1900: 593; Villeneuve 1903: 115; Czerny & Strobl 1909: 204; Sack 1913a: 444; Paramonov 1925: 146, 1926a: 15; Gil Collado 1929: 409; Gil Collado 1930: 243; Bankowska 1980: 38, 40, 83; Marcos García 1985: 137; Peck 1988: 174.
Lampetia spinipes, Oldenberg 1919: 388; Sack 1930: 96, 1931: 327, 1938: 21; Šuster 1959: 243; Séguéy 1961: 176.
Merodon serrulatus, Schiner 1857: 413, 1862: 348; Strobl 1893: 76; Bezzi 1895: 16; Strobl 1900: 593; Czerny & Strobl 1909: 203, 204; Gil Collado 1930: 254.
Lampetia serrulata; Sack 1931: 322.
Merodon italicus, Rondani 1857: 54, 62; Schiner 1857: 413, 1862, 347.
Lampetia italica; Sack 1931: 322.
Merodon rufitibius, Rondani 1857: 55, 66; Palma 1863: 46; Becker 1907: 253.
Lampetia rufitibia; Sack 1931: 327.
Merodon graecus, Schiner 1857; Schiner 1862: 347; Van der Goot 1964b: 218; Peck 1988: 167.
Merodon aurifer; Peck 1988: 174.
Lampetia aurifera; Sack 1931: 327.
Merodon quadrilineatus, Peck 1988: 174.
Lampetia quadrilineata; Sack 1931: 327.

Material examined. – Albania: 1 ♂, 1 ♀ (NHMW); Algeria: 2 ♂, 24 ♀ (MNHN, KBIN); Austria: 53 ♂, 63 ♀ (NHMW, MNHN, BMNH, RMNH); Belgium: 3 ♂ (MNHN, KBIN); Cyprus: 13 ♂, 4 ♀ (KBIN, BMNH); Czechoslovakia: 1 ♂, 1 ♀ (BMNH,

JLR); France: 266♂, 210♀ (MNHN, BMNH, NHMW, RMNH, JLR, ZMAN, WH); Germany: 3♂ (MFNS, JLR); Greece: 96♂, 62♀ (BMNH, RMNH, NHMW, KBIN, MNHN, JLR, den Hollander, ZMUC, Bonn, Coll. Thessaloniki, WH); Hungary: 29♂, 17♀ (Bonn, ZMUC, NHMW, BTM); Italy: 2♀ Paralectotypes of *italicus* '67b' in coll. Rondani (LSF); 2♂, 7♀ Paralectotypes of *rufitibius* '72' in coll. Rondani (LSF); 319♂, 122♀ (ZMUC, KBIN, NHMW, JLR, RMNH, ZMAN, BMNH, LSF, Coll. Marogna (Verona, Italy), WH); Lebanon: 1♀ (KBIN); Libya: 4♂, 2♀ (BMNH); Morocco: 5♂, 8♀ (BMNH, MNHN, JLR, NHMW); Netherlands: 6♂, 2♀ (RMNH, JLR); Poland: 1♂ (ZMUC); Romania: 2♂, 1♀ (BMNH, JLR); Spain: 70♂, 20♀ (ZMUC, ZMAN, RMNH, JLR, WH); Switzerland: 5♂, 6♀ (RMNH, ZMAN, JLR); Turkey: 57♂, 30♀ (JLR, WH, BMNH, NHMW); U. S. S. R.: 4♂, 8♀ (MNHN); Yugoslavia: 70♂, 40♀ (NHMW, BMNH, RMNH, JLR, MNHN, Bonn, ZMAN).

Description

Male. — Head: Antennae with antenna 3 showing subacute apex and convex upper margin, antennal ratio 1.5, pubescence yellow, dark hair-tuft often present in ocellar region; face rather densely white pruinose, partially obliterating blue lustrous surface; occiput concolorous; vertex angle 35°, ocellar angle 40°–45°, tl-v ratio 0.5.

Thorax: Moderately wide, dark, rather dulled by diffuse yellowish pruinosity, dorsum bearing longitudinal pruinose bands of most variable clearness, katepisternum, anepisternum and anepimeron very weakly to conspicuously blue lustrous; pubescence erect, yellowish, moderately dense. Wings clear, veins pale to dark brown; halteres, squamae and antisquamae yellow.

Legs: Dark on trochanters and femora, pale on tibiae and tarsi, but both ends of femora paler and dark band present on tibiae is the usual pattern; there is an immense variation resulting in relatively pale or all dark legs; the femora always mainly dark; trochanters 3 may be acuminate; femora 3 moderately swollen, bearing 6–9 bristles on serrate distal margin of triangular processus.

Abdomen: Slender; dark; T II much tapering, usually with clear yellow lateral spots; pruinose bands on T II–IV clear, arcuate, interrupted, of variable width and colour; pubescence often concolorous with surface, erect, longest anterolaterally; S IV strongly vaulted, deeply acutely emarginate posteriorly.

Genitalia: Anterior surstyle lobe stalked, widening to semicircular apical margin with short even yellow pubescence; posterior surstyle lobe moderately high, slightly elongate, with moderately dense, long, yellow pubescence. Cercus rather large, bearing dense, long, yellow, often wavy pubescence. Aedeagus moderately slender, apical shaft part short, fringed plates on thecal apex recumbent.

Body length 11.5–18 mm.

Female. — Except for sexual dimorphism, differing from the males as follows. Head: Lustrous midstripe on frons occupying 1/4 to 3/4 of width, the lateral pruinose strips usually well defined; face and occiput less lustrous. Thorax: Pruinosity bands clearer, slightly wider. Abdomen: Lateral spots often reddish, conspicuous and extending over part of T III; in some cases however virtually absent; pruinose bands less clear, less wide. T V dark.

Body length 12–17 mm.

Variation. — There is much variation in the coloration in both sexes. Head: The antennae may range from black to bright yellow. Thorax: Lustre most variable, density and colour of pubescence more constant. Legs: The colour is extremely variable; all joints, the tarsi and both ends of the tibiae are paler than the rest of the legs, but the colour may be all black or all yellow throughout. The pubescence is whitish to yellow even in dark specimens. Abdomen: The extent of the yellow colour is variable; the females often show a deeper colour than the males, and are less variable in this respect. Genitalia: The male genitalia are rather constant. The main variation occurs in the length and density of the pubescence on the posterior surstyle lobe and the cercus.

The large degree of variation found in *avidus* is not randomly distributed over the specimens. Many series collected at one site on one date, show uniform characteristics. Size and colour are probably correlated with quantity and quality of food ingested during the larval stages. There is no clear trend in size, morphology or colour of the various local forms over the entire range. Therefore, to present descriptions of local forms, varieties or subspecies is considered inappropriate.

Diagnosis. — *M. avidus* males could possibly be confused with *toscanus* from which they are distinguished by the longer stalk of the anterior surstyle lobe (which in *toscanus* is bifid), the shorter apical shaft part of the aedeagus and the usually much darker abdomen. The unique genitalia are sufficient to distinguish *avidus* males from any other *Merodon* males at first sight. The females are posing many problems since they cannot always be separated from females of the species in the *alagozeicus* group. The best separating characteristic is the pruinosity on the thorax where *avidus* females always show four longitudinal bands, whereas in the females of the *alagozeicus* group there usually is a fifth, anteromedian band as well. Moreover, the abdomen of females in the *alagozeicus* group is usually narrower overall.

Period of flight and distribution (fig. 96). — *M. avidus* occurs in Europe, except the northern parts, in north Africa, the Middle East and Asia Minor from

March through October; the species is very likely multivoltine in the southern parts of its range (cf. Marcos García, 1985). The distribution does not appear to be associated with human activity. As *avidus* is not particularly easy to collect and seems to occur in rather the same habitats as other *Merodon* the relative abundance in collections probably reflects abundance in the field.

Biology. – Few details are known (if the great distribution and abundance is borne in mind). This second most common *Merodon* occurs both in generally wet, and in dry areas, such as the Vosges mountains of France and the inland steppe region of Turkey. There are indications that in the driest parts of its range *avidus* prefers relatively wet biotopes such as lush strips along streams or marshes. Moreover imagines occur early in the season in the hot, dry parts of its range, probably to avoid water shortage later on. Water shortage influences the vegetation and therefore the possibilities for the larvae which are probably phytophagous (all known *Merodon* larvae are phytophagous). There seems to be a preference for flowers of Umbelliferae, as recorded by Šuster (1959) and confirmed by Mr. Lucas' s (Pers. Comm.) and the author's observations in e.g. France, Italy, Greece and Turkey. Some notes on the behaviour of the species are provided by Hurkmans (1988).

Discussion. – No type-material of *avidus* has been found; it might be supposed to be in the Rossi collection at ZMHB (Horn & Kahle 1936), but is not currently present there (dr. H. Schumann, in litt.). The types of *spinipes* are mentioned purely formally as they are too much decayed to be of any value whatsoever. There are considerable difficulties in distinguishing *avidus* from externally similar species, if the genitalia are not used for identification. The existence of the type-specimens in their present state does regrettably forestall designation of a neotype, which would seem to be necessary, given the identification problems mentioned. The original description by Rossi (1790) and following emendations are detailed enough to define *avidus* with respect to the external characteristics. No examination of the genitalia had been made until comparatively recently; especially in *avidus* the use of genital characters for separation from externally resembling species is essential. It is however considered fair to rule that as the overwhelming majority of museum specimens identified as *avidus* examined fulfil the requirements of the original description these specimens must be regarded as the true *avidus*. Moreover most other species externally resembling *avidus* can be (and have been) separated by external characteristics as well, e.g. *nigritarsis* Rondani and *alagozicus* Paramonov.

The *crassifemoris* group

Apomorphies: Posterior surstyle lobe very high, with large anteriorly projecting lobe; cercus reduced.

Merodon crassifemoris Paramonov stat. n.
(figs. 62 a-c, 95)

Merodon spinipes (Fabricius) var. *crassifemoris* Paramonov, 1925: 158. Holotype ♂: 'Theodosia, Krym, 13.vi.1923 [Crimea, U. S. S. R.] [not examined].

Merodon spinipes var. *crassifemoris*; Liepa 1969: 20; Peck 1988: 174.

Lampetia spinipes var. *crassifemoris*, Sack 1931: 328.

Material examined. – France: 1 ♂ (ZMAN); Greece: 2 ♂ (ZMAN); Turkey: 8 ♂ (WH, JLR); U. S. S. R.: 1 ♂, labelled 'Karadagh Krym 16 vii 1929 S. Paramonov. leg. / Typus *Merodon spinipes* Fbr. var. *crassifemoris* var. nov. ♂ / v. Karodke Pinab' (wrongly labelled as a type!) (ZMHB); Yugoslavia: 1 ♂ (ZMAN).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin convex, apex very obtuse, antennal ratio 1.5, vertex angle = 30°, ocellar angle = 40°, tl-v ratio 0.5; pubescence creamy white with dark tuft in ocellar region, face dense whitish pruinose, compound eyes bearing dense white pubescence.

Thorax: Dark, metallic blue lustrous on lateral dorsum and scutellum, katapisternum, anepisternum and anepimeron, longitudinal pruinose bands vestigial to absent; pubescence dark yellow to brownish with vague dark interlar band. Wings clear; halteres, squamae and antisquamae yellow.

Legs: All dark except joints; trochanter 3 angular, femora 3 markedly curved and swollen, with smallish rather steeply rising triangular processus bearing 6-10 bristles on weakly serrate distal margin; tibiae 3 with distal outer angle drawn out into small spur; tarsi 3 with golden pubescence on sides contrasting dark pubescence on upper face, as in *nigritarsis*.

Abdomen: Dark; T II with vague brownish lateral spots, distinctly tapering; T II-IV bearing arcuate conspicuous greyish interrupted pruinose bands; pubescence yellowish grey on bands, dark elsewhere; S IV keeled throughout, posteriorly deeply emarginate.

Genitalia: The anterior surstyle lobe relatively small, reniform, showing dense, short, yellow, even pubescence apically and on margins; coalescent with enormously elongate posterior surstyle lobe which bears rather dense, yellow, uneven pubescence ventrally; posterior part of posterior surstyle lobe with free anteriorly projecting cuneiform part, with dense yellow pubescence laterally and postero-ventrally. Cercus very small, bearing dense, long, yellow pubescence. Aedeagus rather stout, apical shaft part short, fringed plates on thecal apex oblique to erect.

Body length 12–14 mm.

Female. – Unknown.

Diagnosis. – *M. crassifemoris* can be easily separated from other *Merodon* by the anteriorly projecting posterior surstyle lobe; externally the species resembles *avidus*, *nigritarsis*, *femoratooides* and the species in the *alagoezicus* group.

Period of flight and distribution (fig. 95). – The species occurs in the Mediterranean and Black Sea regions in June and July.

Discussion. – Because type-material of *crassifemoris* was not available, identification of this species is largely based on the original description and the specimen in ZMHB, identified as *crassifemoris* by Paramonov himself. Paramonov described var. *crassifemoris* as a variety of *spinipes* Fabricius (= *avidus* Rossi) in view of several external similarities. The genitalia however are rather different and do not indicate a close relationship between *avidus* and *crassifemoris*.

The *elegans* group

Apomorphy: Thin chitinous flanges running along outer face of aedeagus.

Description. – Head: Antennae orange to dark, antennal ratio 1.5–1.8, vertex angle 25–35°, ocellar angle 35–55°, tl-v ratio 0.35–0.6; pubescence white to yellow. Thorax: Pubescence rather short, even; whitish to pale brown. Legs: Dark, usually with yellow markings on apices of femora and at both ends of tibiae; trochanter 3 often edged; femora 3 swollen, strongly curved. Abdomen: Slender to rather stout, T II strongly to moderately tapering; T II–IV bearing arcuate pruinose bands, lateral spots variable. Genitalia: The anterior surstyle lobes large, elongate with concave dorsal margin except *manicatus*; anterior and posterior surstyle lobe separated by sulcus; aedeagus with chitinous flanges on outer face.

Merodon bequaerti sp. n. (figs. 63 a–c, 98)

Type-material: ♂ Holotype 'Noiseux Oran Algeria Dr J Bequaert, 23.IV.10' (written on lower face) / *Merodon parietum* Mg, ♂' (MNHN). 1 ♀ paratype, with label as holotype (MNHN).

Description

Male. – Head: Antennae dark, antenna 3 somewhat paler, densely yellowish pruinose, upper margin slightly concave, apex acute, antennal ratio 1.8; vertex

angle 30°, ocellar angle 40°, tl-v ratio 0.6; pubescence pale yellow with strong dark tuft in ocellar region, occiput deep yellow pubescent; face rather bald, black-bluish lustrous; compound eyes with rather sparse, pale, yellow, short pubescence.

Thorax: Rather dull, some bluish lustre on sides; pubescence even, short, pale brown, erect. Wings tinged evenly, halteres, squamae and antisquamae yellow.

Legs: All dark; the tarsi, especially tarsi 3 with dense recumbent golden pubescence; trochanters 3 with ridge on lower face, femora 3 quite swollen, rather curved, with triangular process bearing 10 bristles; tibiae 3 rather slender, tarsi 3 normally shaped.

Abdomen: Dark, moderately slender, with hardly conspicuous interrupted arcuate whitish pruinose bands; T II somewhat tapering, with orange lateral spots; pubescence rather dense, orangish brown (partially worn off on holotype); T III–IV laterally with cupreous lustre; all S dark, bearing scattered pale erect pubescence; S IV slightly vaulted, its posterior margin entire.

Genitalia: The anterior surstyle lobe ovoid, bearing yellowish pubescence anteriorly and along ventral margin and showing ventro-posterior angle; deep sulcus present between surstyle lobes, connected by a stalk, visible as a broad chitinous plate in top view; the posterior surstyle lobes square, with strong centro-posterior and lesser ventral accessory lobe; pubescence golden, longest, erect on ventral margin and lobes; the centro-posterior lobe bears a single black bristle. Cercus short, wide, showing pale, yellow, long, erect pubescence. Aedeagus with outer face excavate subbasally on outer face, there with paired free chitinous plates, and bearing paired flanges running along all of the outer face; apical shaft part slightly lengthened, fringed plates on thecal apex suberect to recumbent.

Body length 13.5 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Antenna 3 rounded apically, though clearly concave on upper margin; frons dark, slightly greenish metallic lustrous, sparsely pubescent (probably artifact; head has been glued on to the body at some time) ocellar angle 50°. Thorax: Pubescence shorter than in male. Legs: Trochanters 3 smooth. Abdomen: Less dense pubescent except on lateral spots; T II less tapering; T V dark, tapering.

Body length 13 mm.

Diagnosis. – *M. bequaerti* can be easily recognized by the stout build of both sexes in comparison with other species of the *elegans* group. The females may

pose problems but the combination of swollen femora 3 and arcuate pruinose bands on the abdomen will separate this species from e.g. *ruficornis* and its allies which have more conspicuous, less arcuate pruinose bands.

Period of flight and distribution (fig. 98). – This species is known only from the types, collected in Algeria in April.

Etymology. – The epitheton *bequaerti* has been derived from the collector's name on the labels of both type specimens. A noun in genitive case.

Merodon elegans sp. n.
(figs. 64 a-c, 99)

Type-material: ♂ Holotype 'Italia Sicilia V. S. v. d. Goot/ Etna rif. Filiciusa 1400-1500 m 22-28.vii.1961 / Lampetia spinipes det. V. S. v. d. Goot 1963 / Type A' (ZMAN). – Paratypes: 52♂, 24♀; 19♂, 10♀ with same data as holotype but collectors V. S. v. d. Goot & J. A. W. Lucas (14♂ JLR, 5♂, 10♀ RMNH); 1♂ 'Italia, S. Castaldo vi.1937, A. Loken leg.' (ZMUC); 3♂ 'Sicilia Schiodte' (ZMUC); 1♂ 'Italia, Calabria 18.v.1954 F. F. Tippmann' (RMNH); 1♂ 'France Aveyron 19.vii.1980 D. Prins' (Coll. D. Prins, Rhenen, The Netherlands); 3♂ 'France Vaucluse Cheval Blanc 7.vii.1973 H. I. Meuffels' (JLR); 1♀, same data, collected 9.vii.1973 (JLR); 2♂ 'France Estagel 22.vi.1982 exc. LH Wageningen' (LHW); 2♂ 'France, Chateau de Peyperouse 25.vi.1982 exc. LH Wageningen (LHW); 1♂ 'France, Mts. de Tauch, exc. LH Wageningen 23.vi.1982' (LHW); 1♂ 'S. F. Chânes des Alpilles, Les Baux 21.vii.1980 Barkemeyer' (Coll. C. Clausen, Flensburg); 3♂ 'Espana Torla Huesca 1035 m, 8/26 vii.1974 J. Wolschrijn' (JLR); 5♂ 'Espana Valencia Moraira 16/30.v.1981 van Aartsen (3 JLR, 1 RMNH, 1 ZMAN); 4♀ 'Espana, Guadalajara, Molina 1100 m 11.vii.1977 W. Schacht' (JLR); 1♀ 'Espana Tragacete 1300 m, 17.vii.1974 W. Schacht' (JLR); 2♂ 'Espana Catalonia, Espluga de F., 3.vii.1920 Codina' (RMNH); 1♂ 'Espana Catalonia Carretera [=road] de Espluga de F. a Massies' (RMNH); 1♂, 1♀ 'Espana Teruel M. J. & J. P. Duffels / Rafales 35 km ZO v. Alcaniz 600 m 12.vii.1972' (ZMAN); 3♂ 'Espana, Lebena (Santander) 5.vii.1986 Ma. A. Marcos García' (SAL); 1♂, 1♀ 'Algerie, Alger Dr. Bequaert, Foret de Buïnen (MNHN); 1♂ 'Algerie, Alger Dr. Bequaert Benandreit' (MNHN); 1♂ 'Algeria, Le Tarf 27.vii.1896 A. E. Eaton' (BMNH); 3♂ 'Maroc Mehdiâ (Ft. Lyautey) 31.v.1.vi.1950 P. M. F. Verhoeff' 3♂ (-RMNH).

Description

Male. – Head: The antennae orange to brown, antenna 1 darkest, antenna 3 with upper margin slightly convex, apex obtuse, antennal ratio 1.6; pubescence dull yellow, erect, even, with rather large dark tuft in ocellar region; vertex angle 30°, ocellar angle 50°, tl-v ratio 0.6; face and occiput diffusely whitish pruinose, blue metallic lustrous.

Thorax: Dark, with inconspicuous longitudinal

pruinose bands; lateral dorsum and scutellum as well as sides blue metallic lustrous; pubescence brownish to yellow, erect, short, rather even, a dark interalar band present in some specimens; pubescence on posterior margin of scutellum longer; some diffuse pruinosity on dorsum and sides. Wings clear to evenly slightly tinged throughout; halteres, squamae and antisquamae yellow.

Legs: Dark with yellow markings apically on femora, both ends of tibiae and most of tarsi; trochanter 3 smooth, femora 3 quite swollen, metallic lustrous, with normally shaped triangular processus bearing 6-9 bristles on moderately serrate distal margin.

Abdomen: Dark; T II strongly tapering, with large pale yellow to deep orange vaguely bordered lateral spots; pruinose bands white, interrupted, moderately wide, arcuate; pubescence yellowish, densest laterally; S IV rather vaulted, narrowly emarginate posteriorly.

Genitalia: The anterior surstyle lobe large, reniform, with short, dense, even, yellow pubescence; separated from posterior surstyle lobe by deep sulcus; posterior surstyle lobe high, large, bearing rather long, dense, yellow pubescence laterally and on ventral-posterior margin, with lateral accessory lobe bearing dense concolorous pubescence. Cercus angular, well protruding, densely long yellow pubescent. Aedeagus rather slender, with paired high chitinous flanges on outer face and bearing paired basal humps; apical shaft part short, fringed plates on thecal apex oblique to recumbent.

Body length 13-15.5 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Frons with lustrous midstripe occupying less than one-third of width; clear frontal depression of ovoid outline present. Thorax: Pruinosity bands clearer, in some specimens a fifth anteromedial band can be found. Legs: Orange markings on basal femora more extensive, femora 1 and 2 often apically widely yellow. Abdomen: T II conspicuously bright orange; pruinose bands on T III IV continuous; pubescence sparser than in male.

Body length 13-15 mm.

Diagnosis. – The conspicuous flanges on the aedeagus distinguish *elegans* from species outside the *elegans* group. *M. elegans* may be separated from *bequaerti* by the longer posterior surstyle lobe, the slenderer habitus and greater size; from *manicatus* by the different shape of the surstyle and possession of an accessory lobe on the posterior surstyle lobe in *elegans*; from *testaceus* also in the surstyle shape, the height of the aedeagal flanges, the overall size and the absence of typical red abdominal coloration as in *testaceus*. The females of *elegans* are similar to the females of the *alagoezicus* group, *avidus* and many other species,

from which they can be distinguished by their frontal depression.

Period of flight and distribution (fig. 99). – *M. elegans* occurs from May to July in the western part of the Mediterranean.

Discussion. – Van der Goot (1964a) noticed differences among sets of specimens then considered to belong to *avidus*, and distinguished between types A and B. Examination of the genitalia showed that type B corresponded to *avidus* whereas type A was shown to be a new species, described here. The flight period coincides with that of *avidus* in the mediterranean region; the distribution of *elegans* is much more restricted than that of *avidus* and seems to be Mediterranean. As the species are very similar externally (*elegans* has longer, rougher pubescence on the thorax and more metallic lustre on face and femora 3, which is more swollen than in *avidus*) and their flight period overlaps, some of the *avidus* records in literature probably pertain to *elegans*.

Etymology. – The adjective *elegans* is latin, meaning well-formed, and refers to the slender habitus of the species.

Merodon manicatus (Sack)

(figs. 65 a-c, 98)

Lampetia manicata Sack, 1938: 21. Holotype ♂: 'Štip, v.1937, leg. R. Meyer/ *Lampetia manicata* Sack det. Sack' (HLM) [examined].

Lampetia manicata, Sack 1938: 21.

Merodon manicatus, Peck 1988: 171.

Material examined. – Macedonia: ♀ Paratype with same labels as holotype (HLM).

Description

Male. – Head: Antennae dark, antenna 3 ovoid, upper margin strongly convex, apex obtuse, antennal ratio 1.6; pubescence pale yellow with some dark pubescence in ocellar region; vertex angle 30°, ocellar angle 55°, tl-v ratio 0.35; face rather densely white pruinose; compound eyes bearing rather short, dense, white pubescence.

Thorax: The dorsum and scutellum showing weak olivaceous lustre laterally; same lustre stronger on kat-episternum, anepisternum and anepimeron; longitudinal pruinose bands weak; pubescence golden, erect, moderately dense, even, slightly longer and paler laterally. Wings tinged overall; halteres, squamae and antisquamae pale yellow.

Legs: Dark, with some olivaceous lustre on femora 3; tibiae with yellow markings at both ends; tarsi dark, but with recumbent dense golden pubescence

on lower face, strongest on tarsi 3; trochanter 3 with distinct sharp ridge, femora 3 strongly swollen, much curved, bearing normally shaped triangular process bearing 7 bristles on moderately serrate distal margin.

Abdomen: Dark; T II with large orange lateral spots, continued on T III; T II-IV showing rather faint white pruinose arcuate bands best observed from behind, hardly interrupted medially; all S orange, bearing erect white pubescence; S IV darker, slightly keeled, deeply narrowly emarginate posteriorly; abdominal pubescence in general very sparse compared to other *Merodon*, concolorous with surface and very short medially.

Genitalia: The anterior surstyle lobe reniform, bearing dense short even yellowish pubescence anteriorly and ventrally, separated from the posterior surstyle lobe by a moderately deep sulcus; the posterior surstyle lobe with yellow pubescence, bearing distinct anteromedial accessory lobe with pubescence erect and long; main disc of posterior surstyle lobe bearing shorter pubescence, somewhat diamond-shaped. Cercus angular, with same pubescence as posterior surstyle lobe. Aedeagus moderately slender, bearing paired translucent, twice interrupted (artifact?) chitinous flange on outer face, apical shaft part slightly lengthened, fringed plates on thecal apex oblique; paired humps present basally on outer face.

Body length 11.5 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Frons with lustrous midstripe occupying rather less than a quarter of the frontal width just above the antennae, but wider posteriorly; ocellar angle 60°. Thorax: Pruinose bands more clear due to shorter, less dense pubescence; sides much less lustrous than in male. Legs: The femora 3 less swollen, less curved, less lustrous. Abdomen: Predominantly orange; T V with dark median zone; pruinose bands widely interrupted; pubescence very sparse, even shorter than in male.

Body length 11 mm.

Diagnosis. – The males *manicatus* are distinguished from those of *bequaerti* by the much slenderer habitus and more rounded anterior surstyle lobe as well as the sparse pubescence; from those of *elegans* also by the rounded anterior surstyle lobe, and much smaller size; from those of *testaceus* by the less slender habitus of *manicatus* and its less tapering T II, and the more rounded anterior surstyle lobe; from all other species by the aedeagal flanges. The females of *manicatus* are slenderer than those of *elegans* and *bequaerti*, but are hard to separate from those of *testaceus*; they can however be distinguished by the more acute ocellar triangle with ocellar angle 60°, (70° in *testaceus*). From all other species they differ in the combination of ex-

tremely slender build, moderate size and red abdominal colour, which is of a quite different type than found in the *longicornis* group where the colour is deep crimson.

Period of flight and distribution (fig. 98). – The species occurs in Macedonia in May, and is currently known only from the types.

Merodon testaceus Sack
(figs. 66 a-c, 98)

Merodon testaceus Sack, 1913a: 445. Lectotype ♂ (here designated): 'Asia minor/ Alte Sammlung/ *Merodon testaceus* type Sack/ *testaceus* det. Sack' (NHMW) [examined].
Merodon testaceus; Paramonov 1925: 154; Peck 1988: 175.
Lampetia testacea; Sack 1931: 329, 1938: 21.

Material examined. – 3♂, 1♀ Paralectotypes, 'Asia Minor/ idae det. Schiner/ Alte Sammlung/ *testaceus* det. Sack' (NHMW); 2♀ Paralectotypes, 'Mann, Brussa [=Bursa, Turkey], 1863/ idae det. Schiner/ Alte Sammlung/ *testaceus* det. Sack' (NHMW).

Description

Male. – Head: Antennae orange to brown, antenna 3 with upper margin convex, apex obtuse, antennal ratio 1.8; vertex angle 25°, ocellar angle 35°, pubescence pale yellow, tl-v ratio 0.35.

Thorax: Dark, with pruinose bands inconspicuous; dorsum and scutellum dark, katapisternum, anepisternum and anepimeron blue metallic lustrous, pubescence rather sparse, short, whitish. Wings clear, halteres, squamae and antisquamae yellow.

Legs: The femora dark, tibiae dark with yellow markings at both ends, tarsi brown to yellow, in some specimens with faint dark band; trochanters 3 with conspicuous edge, femora 3 strongly swollen, curved, with normally shaped triangular process bearing 6 stout bristles on rather weakly serrate distal margin with relatively large apical spurlet.

Abdomen: Slender; T II strongly tapering; predominantly orange to reddish brown, with clear arcuate narrowly interrupted white pruinose bands on T II-IV; S IV slightly keeled, deeply emarginate posteriorly. Genitalia: The anterior surstyle lobe bearing dense, short, yellow, even pubescence apically and on margins, with incision on dorsal margin, ridged laterally, separated from the posterior surstyle lobe; the posterior surstyle lobe with anterior accessory lobe bearing dense long yellow pubescence; main disc rather elongate, protruding far posteriorly, bearing rather dense yellow pubescence posteriorly. Cercus angular, with dense long yellow pubescence. Aedeagus moderately slender, bearing large paired humps subbasally on outer face as well as paired chitinous flanges; apical shaft part short, fringed plates

on thecal apex recumbent.

Body length 10 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Frons black, lustrous on median one-third, sides diffusely whitish pruinose, pubescence concolorous, ocellar angle 70°. Thorax: Pubescence notably short, pruinose bands more conspicuous. Legs: Femora 3 less swollen. Abdomen: Slightly stouter than in male, orange to brown throughout, pruinose bands slightly less conspicuous.

Body length 10.5 mm.

Diagnosis. – The males of *testaceus* can be distinguished from those of *bequaerti* by the less stout habitus, from males of *elegans* and *manicatus* by the lower aedeagal flanges, and from those of *elegans* by smaller size as well. Moreover, they differ from males of *manicatus* also by slenderer abdomen, less rounder antenna 3 and shorter thoracic pubescence. From all other *Merodon* they differ by the aedeagal flanges. The females can be distinguished by their red abdominal coloration, size and slender habitus from all species. The differences with females of *manicatus* are: the larger ocellar angle (70° here, 60° in *manicatus*) and the slightly greater antennal ratio (1.8 versus 1.6 in *manicatus*).

Period of flight and distribution (fig. 98). – *M. testaceus* occurs in Turkey; the flight period is unknown.

The *alagoezicus* group

Apomorphies: Apical shaft part lengthened in aedeagus of the ♂; fringed plates on thecal apex of aedeagus oblique to erect.

Description

Head: Antennae variably coloured but antenna 3 often paler than rest; face with often strong blue metallic lustre; pubescence yellow to whitish; vertex angle in the males 25-35°, ocellar angle in both sexes approximately 45°.

Thorax: Dark, with longitudinal pruinose bands on dorsum more or less clear; katapisternum, anepisternum and anepimeron often with very strong blue lustre. The females show 5 longitudinal pruinose bands.

Legs: The usual pattern of coloration is: femora dark, tibiae yellow with wide dark band and sometimes with distal spur, tarsi dark; the tarsi 3, especially basitarsi 3 often with dense golden recumbent pubescence on sides, contrasting dark pubescence on upper face; this contrast is less strong in the females.

Abdomen: Slender, T II strongly tapering, T IV often bulging to hold the relatively large genitalia in the males; usually slender, triangular in the females; pruinose bands strongly arcuate, the one on T IV in the males often recurving laterally; lateral portions of tergites often metallic lustrous.

Genitalia: The anterior surstyle lobe lengthened, extremely lengthened in some species; accessory lobes may be present on both main surstyle lobes. Cercus usually large, always well protruding. Aedeagus slender, invariably with extremely lengthened apical shaft part, outer face often with humps or plates; fringed plates on thecal apex suberect to erect.

Identification of females in the *alagoezicus* group. – Apart from the females of *satdagensis* which have been so assigned on the grounds of associated capture, the females in this group cannot be assigned to any species yet. As a group these females can be distinguished from those of other groups by the presence of 5 pruinose bands on the thorax (4 bands in other groups), relatively large size and slender, usually triangular abdomen.

***Merodon alagoezicus* Paramonov**
(figs. 67 a, 68 a-d, 99)

Merodon alagoezicus Paramonov, 1925: 151. Syntypes δ : 'Inaklu, Etschmiadzin, Erivan district, Armenia, Southern slope of Mount Alagöz' [not examined].

Merodon alagoezicus, Paramonov 1926a: 15; 1926b: 318; 1927: 74; Liepa 1969: 20; Peck 1988: 166.

Lampetia alagoëica, Sack 1931: 303 [orthographic error].

Material examined. – Greece: 3 δ (ZMUC); Turkey: 81 δ (JLR, WH, BMNH).

Description

Male. – Head: Antennae brown to pale brown, antenna 3 palest, with upper margin convex, apex obtuse, antennal ratio 1.7; pubescence pale yellow, conspicuously dense on frons; face strongly blue metallic lustrous, sparsely pruinose throughout; vertex angle 30°, ocellar angle 40°, tl-v ratio 0.65; compound eyes bearing inconspicuous pale pubescence.

Thorax: Dark; blue lustrous on lateral dorsum and scutellum, katapisternum anepisternum and anepimeron; pubescence rather even, moderately long, pale yellow on dorsum, longer and less even on sides; in many specimens vague dark interalar band present; longitudinal pruinose bands vestigial to well-defined. Wings clear; halteres, squamae and antisquamae yellow.

Legs: The femora dark with narrow paler apices; tibiae dark with yellow apices and, in most specimens, yellow bases; tarsi dark, golden pubescence on

sides and lower face, upper face dark; trochanter 3 with inconspicuous low ridge, femora 3 swollen, slightly curved, with normally shaped triangular process bearing 6-9 bristles on serrate distal margin; tibiae 3 with distal outer angle much projecting, spur-like; tarsi 3 normally shaped.

Abdomen: Dark; T II tapering, bearing yellow to orange lateral spots with deep lanceolate postero-lateral dark indentation; T II-IV with arcuate interrupted moderately wide pale pruinose bands, on T IV recurving laterally; pubescence mainly pale, with some dark pubescence on dark surface in most specimens; S IV widely, rather acutely emarginate posteriorly up to two-thirds of its length.

Genitalia: Anterior surstyle lobe ventro-posteriorly recurved, enormously elongate, its apical portion showing dense, even, yellow, short pubescence; the posterior surstyle lobe coalescent, rather low, with moderately dense, yellow, erect pubescence along entire medio-apical margin and posteriorly. Cercus large, rounded, showing dense, long, erect, yellow pubescence. Aedeagus smooth, with paired recumbent chitinous plates on outer face guarding the subapical cavity; apical shaft part long, the fringed plates on thecal apex erect.

Body length 12-15 mm.

Female. – Unknown (see preceding observation).

Diagnosis. – In view of the curious genitalia *alagoezicus* can be confused with *lucasi* only; from that species it is distinguished by the projection at the distal outer angle of tibiae 3 and the lack of a semicircular projection on the posterior surstyle lobe; *alagoezicus* can be easily distinguished from the other members of this group by the much longer anterior surstyle lobe.

Period of flight and distribution (fig. 99). – The species occurs from June through August in south-eastern Europe, Turkey and Armenia.

Biology. – Specimens have been collected in wet grassland on white- and yellow-flowering Umbelliferae; the majority of the specimens was collected in mountains at altitudes over 1500 metres.

***Merodon lucasi* sp. n.**
(figs. 67 d, 69 a-c, 102)

Type-material: δ Holotype 'Turkey, Hakkari, Suvarihalil pass 2300-2400 m, 11.viii.1983, leg. J. A. W. Lucas' (ZMAN). Paratypes: 22 δ ; 8 δ with same data as holotype (JLR); 4 δ 'Turkey, Konya 1300 m, 5/6.viii.1981, leg. H. Coene et al.' (JLR); 1 δ 'Turkey, Hakkari, Suvarihalil pass 2.viii.1982 M. Kuhbandner' (JLR); 2 δ 'Turkey Pr. Hakkari Suvarihalil Pass SE Beytisebap 2300 m 2.viii.1982 and

27.vi.1985 W. Schacht (JLR); 1 ♂ 'Turkey, Kars, Handere 20 km W. Sarikamis 2100 2200 m, 1.viii.1983 leg. J. A. W. Lucas' (JLR); 2 ♂ 'Turkey, Hakkari, Suvarihalil pass 2300 m 27.vi.1985 C. J. Zwakhals (JLR); 1 ♂ 'Turkey, Hakkari S of Yüksekova, Sat Daglari 1700 m 28.vi.1985 leg. W. Schacht (JLR); 1 ♂ 'Turkey, Hakkari, Vargös Sat Daglari 1700 m 29.vi.1985 W. Schacht' (JLR); 1 ♂ 'Turkey, Hakkari, Habero Deresi valley 1200 m 25.vi.1985 W. Schacht (JLR); 1 ♂ 'Turkey, Erzurum, Palandöken Dagi 2300 m 11.vii.1986 leg. J. A. W. Lucas' (JLR).

Description

Male. – Head: Antennae dark, antenna 3 with upper margin concave, apex obtuse to subacute, antennal ratio 1.4; vertex angle 35°, ocellar angle 45°, tl-v ratio 0.6, pubescence pale yellow, denser on frons where causing silky lustre; face bronze to blue lustrous, sparsely white pruinose.

Thorax: Dark; blue lustrous on katapisternum, anepisternum, anepimeron and (less strong) on lateral scutellum and dorsum; pubescence pale brown to yellow, moderately dense; pruinose bands inconspicuous, the median bands clearest; a fifth anteromedian band often present; these bands often cross-connected along dorsal suture. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: Dark with yellow markings on femoral apices and both ends of tibiae; trochanter 3 with low but well marked sharp ridge; femora 3 swollen, curved, triangular processus bearing 7-9 bristles on weakly serrate distal margin with clear apical pedestal; tibiae 3 with apical outer angle projecting slightly, tarsi 3 normally shaped.

Abdomen: Dark; slender; T II strongly tapering, T IV bulging; T II with conspicuous orange lateral spots, T II-IV with arcuate interrupted moderately wide, well bordered white pruinose bands; pubescence concolorous but many pale yellow hairs mixed in laterally and posteriorly on T III-IV, densest on lateral spots; S IV widely acutely emarginate up to half its length.

Genitalia: Anterior surstyle lobe ventro-posteriorly recurved, enormously elongate, apically with dense even short yellow pubescence; the posterior surstyle lobe coalescent, anteriorly showing semicircular ventral projection and bearing yellow moderately dense erect pubescence. Cercus large, quadrate, with dense, long, yellow pubescence. Aedeagus rather slender, with paired humps on basal outer face and bearing chitinous plates guarding subapical cavity, apical shaft part long, fringed plates on thecal apex narrow, long, erect.

Body length 11-15 mm.

Female. – Unknown (see preceding observation).

Diagnosis. – *M. lucasi* can be distinguished from

the other members of the *alagoezicus* group by the much longer anterior surstyle lobe, and moreover from *alagoezicus* by the semicircular plate on the posterior surstyle lobe and by having no large spur on tibiae 3.

Period of flight and distribution (fig. 102). – The species is known from Turkey where it was collected in June and August.

Etyymology. – It is a pleasure to dedicate this species to Jan Lucas who collected an enormous amount of specimens which were generously placed at the author's disposal. A noun in genitive case.

Merodon nitidifrons sp. n.

(figs. 70 a-d, 101)

Type-material: ♂ Holotype 'Turkey, Hakkari, Suvarihalil pass 2300 m [37° 25' N, 43° 03' E], 13.vi.1984, leg. J. A. W. Lucas' (ZMAN).

Description

Male. – Head: Antennae orange, antenna 3 with convex darkened upper margin, apex subacute, antennal ratio 1.3; vertex angle 25°, ocellar angle 35°, tl-v ratio 0.55; pubescence yellow, densest and recumbent on frons where causing silky lustre; face densely white pruinose over blue metallic surface; some dark pubescence present in ocellar region.

Thorax: Dark, blue lustrous on katapisternum, anepisternum and anepimeron, lateral dorsum and scutellum; conspicuous longitudinal bands on dorsum in two pairs and a fainter anteromedian band; pubescence dull golden, moderately dense, most even. Wings clear; halteres, squamae and antisquamae yellow.

Legs: Dark but femoral apices and both ends of tibiae orange; trochanters 3 smooth, femora 3 slightly swollen, triangular processus rather low, bearing 4-6 rather weak bristles on hardly serrate distal margin; tibiae 3 with distal outer angle somewhat projecting.

Abdomen: Slender, T II much tapering, T IV bulging; T II-III with pale orange lateral spots, T II-IV with arcuate rather wide pale pruinose bands (interrupted on II-III, continuous and laterally recurved on IV), pubescence concolorous; on closer examination T IV shows small orange anterolateral spots.

Genitalia: The anterior surstyle lobe much elongate, narrow, evenly wide throughout, apically recurved medially and bearing dense, short, even, yellow pubescence; basally bearing accessory lobe on medial face; this lobe is visible as a ridge in lateral view and has same pubescence as apical anterior surstyle lobe part; the posterior surstyle lobe coalescent, moderately high, elliptical, bearing moderately dense

long yellow pubescence in strip along margins. Cercus wide, with long, dense, somewhat wavy, yellow pubescence. Aedeagus very slender, bearing paired chitinous plates guarding subapical cavity, apical shaft part long, fringed plates on thecal apex sub-erect.

Body length 15.5 mm.

Female. – Unknown. (see preceding observation)

Diagnosis. – *M. nitidifrons* is easily distinguished from other members of the *alagoezicus* group by the ribbon-shaped, medially recurved anterior surstyle lobe.

Period of flight and distribution (fig. 101). – This species is known only from the holotype, collected in eastern Turkey in June.

Etymology. The epitheton *nitidifrons* derives from the latin *nitere*, to shine, and *frons*, a part of the head so indicated, and refers to the silky lustrous frons. It is to be treated as a noun in apposition.

Merodon satdagensis sp. n.
(figs. 67 c, 71 a-c, 101)

Type-material: ♂ Holotype 'Turkey, Hakkari, Suvarihalil pass 2300 m, SE Beytisebap 2.viii.1982 leg. W. Schacht' (ZMAN). Paratypes: 31 ♂, 2 ♀; 2 ♂ with same data as holotype (JLR); 5 ♂ topotypic, 4.viii.1982, leg. J. A. W. Lucas (JLR) 5 ♂ topotypic, 11.viii.1983, leg. J. A. W. Lucas (JLR); 3 ♂ 'Turkey, Hakkari, Vargös S. of Yüsekova 1700 m 29.vi.1983 leg. W. Schacht' (JLR); 12 ♂ from same locality, 5-8.viii.1983, leg. Schacht (JLR), 1 ♂, 2 ♀ from same locality, 5-8.viii.1983, leg. Lucas (JLR); 1 ♂ 'Turkey, Hakkari, Sat Dag, North of Mt. Gavaruk 2900 m, 7.viii.1983 leg. Kl. Warncke' (JLR); 1 ♂ 'Turkey, Hakkari, Habur Deresi S. of Yüsekova, 26.vi.1985, leg. Schacht' (JLR); 1 ♂ 'Turkey, Hakkari, S of Yüsekova 1700 m, 28.vi.1985, leg. W. Schacht' (JLR).

Description

Male. – Head: Antennae dark orange to brown, antenna 3 paler, upper margin convex, apex obtuse, antennal ratio 1.3, vertex angle 35°, ocellar angle 45°; pubescence yellowish white, rather dense on face and frons; face and vertex blue metallic lustrous, moderately dense white pruinose; tl-v ratio 0.3.

Thorax: Dark, katapisternum, anepisternum anepimeron, lateral dorsum and scutellum blue to green or slate grey lustrous; two pairs of narrow longitudinal pruinose bands present; pubescence pale brown to yellow, moderately dense, rather even. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: Dark, but tibiae yellow with wide dark distal band, femora apically yellow in most specimens; trochanters 3 smooth, femora 3 swollen, curved, triangular processus normally shaped, bearing 7-9 bristles

on serrate distal margin; tibiae 3 apically with spurlike outer angle.

Abdomen: Dark, slender, T II strongly tapering, with large pale yellow lateral spots; T II-IV with moderately wide interrupted (continuous on T IV) whitish strongly arcuate well bordered pruinose bands, sometimes combined with red surface coloration; T IV bulging; pubescence concolorous but many pale hairs present throughout; S IV deeply widely emarginate, strongly vaulted; T IV posteriorly pruinose.

Genitalia: The anterior surstyle lobe much elongate, apical part recurved, dorso-ventrally aligned, with subbasal ventral accessory lobe; both apical part and this lobe short dense erect even yellow pubescence; the anterior and posterior surstyle lobes separated by shallow sulcus; posterior surstyle lobe elongate, twisted, with long, yellow pubescence posteriorly and along medial distal margin. Cercus large, elongate, with denser pubescence than posterior surstyle lobe. Aedeagus extremely long, slender, bearing paired chitinous flanges guarding subapical cavity which due to extreme length of apical shaft part is situated halfway up the aedeagus; fringed plates on thecal apex erect, rather long and narrow.

Body length 12-15 mm.

Female. – Except for sexual dimorphism, differing from the male as follows. Head: Lustrous midstripe on frons occupying 1/4 of width; ocellar angle 45°, antennae with third article darkest. Thorax: Pubescence shorter, more even, a fifth anteromedian pruinose band present. Legs: the spurlet on tibiae 3 lacking. Abdomen: T II less tapering, lateral spots larger, pruinose bands less wide; T IV posteriorly pruinose.

Body length 13 mm.

Diagnosis. – *M. satdagensis* males will be easily distinguished by the long anterior surstyle lobe with subbasal accessory lobe and twisted posterior surstyle lobe. The females are very similar to other females of species in this group; they can preliminarily be distinguished from those of other species by the strongly serrate triangular processus; see preceding observation.

Period of flight and distribution (fig. 101). – *M. satdagensis* is known from south-eastern Turkey where it occurs late in June and in August. The known range of the species is restricted to the Sat Mountains in the Turkish province of Hakkari near the Iranian and Iraqi borders.

Discussion. – The females have been assigned to *satdagensis* given their concurrent flight in the same biotope at Vargös in the Sat mountains of eastern Turkey; moreover the much serrate triangular proces-

sus in these females occurs in males of only two species of the *alagoezicus* group, viz. *satdagensis* and *taniniensis*, of which the latter is stouter, much lighter coloured and in the possession of much wider abdominal pruinose bands; the females concerned being relatively dark and slender were assigned to *satdagensis*.

Etymology. – The epitheton is an adjective, and named after the Sat Daglari, a mountain range in south-eastern Turkey.

Merodon schachti sp. n.
(figs. 67 b, 72 a-c, 100)

Type-material: ♂ Holotype 'Turkey, Hakkari, Suvarihalil pass 2300 m, 2.viii.1982 leg. W. Schacht' (ZMAN). Paratypes: 9♂; 2♂ topotypic, 11.viii.1983 leg. J. A. W. Lucas (JLR); 1♂ topotypic, 13.vi.1984 leg. Lucas (JLR); 1♂ 'Turkey, Hakkari, Tanin-Tanin pass 1700 m (W side near Habul Deresi) 12.vi.1984 leg. Lucas' (JLR); 3♂ from same locality, 25.vi.1985 leg. W. Schacht (JLR), 1♂ from same locality, 25.vi.1985 leg. C. J. Zwakhals (JLR); 1♂ 'Turkey, Hakkari, Habur Deresi valley 26.vi.1985 1700 m leg. Schacht' (JLR).

Description

Male. – Head: Antennae orange-brown, antenna 3 slightly paler, upper margin convex, apex obtuse, not rounded, antennal ratio 1.3; pubescence whitish, densest on frons; face blue metallic lustrous, diffusely white pruinose (densest medially); vertex angle 25°, ocellar angle 40°, tl-v ratio 0.4.

Thorax: Dark, blue lustrous on katapisternum, anepisternum and anepimeron, lateral dorsum and scutellum; pruinose bands on dorsum in anteriorly coalescent pairs, narrow; pubescence sparse, pale brown to yellow. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: Dark with yellow markings on apices of femora and both ends of tibiae; trochanter 3 smooth, femora 3 swollen, somewhat curved, triangular process bearing 7-9 bristles on slightly serrate distal margin (less serrate than in *satdagensis* but more than in *alagoezicus*); tibiae 3 with distal outer angle extended, tarsi 3 normally shaped.

Abdomen: Dark; slender; T II strongly tapering, T IV bulging, T II-III with large and small orange lateral spots respectively; T II with weak, T III-IV with strong whitish interrupted arcuate pruinose bands, the one on T IV recurved laterally; posterior margins of T III-IV pruinose; pubescence pale, but strictly dark on posterior, dark surface of T III; S IV acutely emarginate posteriorly up to 3/4 its length or even more.

Genitalia: Anterior surstyle lobe very elongate, recurved apically, there dorso-ventrally aligned, apically

bearing dense, yellow, short, even pubescence; anterior surstyle lobe coalescent with gradually rising posterior surstyle lobe elongate, low, and bearing moderately long, yellow pubescence along its distal margin and posteriorly; posterior surstyle lobe laterally guarded by a free chitinous plate basally attached to the surstyle base; this plate has a distinct antero-ventral angle and a lateral approximately dorso-ventral ridge and posteriorly shows dense yellow pubescence. Cercus large, with dense, long, erect, yellow pubescence. Aedeagus quite robust, apical shaft part lengthened much, fringed plates on thecal apex erect, long and narrow, some scattered short pubescence present on inner face.

Body length 13 mm.

Female – Unknown (see preceding observation).

Diagnosis. – *M. schachti* can hardly be confused with any other species given the very conspicuous lateral guarding plate alongside the posterior surstyle lobe in the males; moreover, the robust aedeagus separates it from other species in the *alagoezicus* group.

Period of flight and distribution (fig. 100). – The species is known exclusively from the south-easternmost region of Turkey where it has been collected in June and August.

Etymology. – The species is named after the collector of the type, the German entomologist Dr. Wolfgang Schacht, of Munich. A noun in genitive case.

Merodon taniniensis sp. n.
(figs. 73 a-c, 100)

Type-material: ♂ Holotype 'Turkey, Hakkari, Tanin-Tanin pass W. side 1700 m, 12.vi.1984 leg. J. A. W. Lucas' (ZMAN). Paratypes: 6♂; 2♂ with same data as holotype (JLR); 2♂ 'Turkey, Hakkari, Tanin-Tanin pass E Uludere 2300 m 25.vi.1985 leg. W. Schacht' (JLR); 1♂ 'Turkey, Hakkari, Suvarihalil pass near Habul Deresi 1250 m 13.vi.1984 leg. Lucas' (JLR); 1♂ 'Turkey, Malatya, Sarıhacı 45 km W. Malatya 21.vi.1984 leg. Lucas' (JLR).

Description

Male. – Head: Antennae brown, antenna 3 with upper margin convex, apex obtuse, antennal ratio 1.6, pubescence whitish pale yellow throughout; vertex angle 25°, ocellar angle 45°, tl-v ratio 0.4; face blue metallic lustrous, densely white pruinose.

Thorax: Dark, lustrous on katapisternum, anepisternum, anepimeron and lateral dorsum and scutellum; dorsum showing 5 pruinose bands; pubescence yellow, very even, moderately dense. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: Dark but tibiae yellow with wide dark distal band; trochanter 3 with low sharp ridge, femora 3 swollen, curved, triangular processus bearing 6-8 bristles on somewhat serrate distal margin.

Abdomen: Slender; T II strongly tapering, T IV bulging, predominantly orange, with connected anterior and posterior dark lunules on T II and weaker brown medial coloration on T III; posterior lunules on T III-IV pale brown to orange; T II-IV bearing rather wide strongly arcuate, interrupted to continuous whitish pruinose bands (recurved on T IV); pubescence pale yellow, moderately dense (also on dark surface); all S orange, S IV widely, obtusely emarginate, slightly vaulted.

Genitalia: The anterior surstyle lobe large, rather quadrate, slightly bifid anteriorly, bearing dense short erect yellow even pubescence; connected by a slender stalk to the base of the posterior surstyle lobe, a deep narrow sulcus separating from the apical part; the posterior surstyle lobe twisted, bearing two apical ridges, both bearing long, erect, yellow, sparse pubescence, posterior part of posterior surstyle lobe with dense pubescence. Cercus large, mainly hidden between the elongate posterior parts of the posterior surstyle lobes, with dense, long, yellow pubescence. Aedeagus slender, apical shaft part lengthened, ring paired chitinous plates guarding subapical cavity (these plates do not resemble those found in the *elegans* group); fringed plates on apex aedeagi erect, long and rather narrow.

Body length 14-16 mm.

Female. – Unknown (see preceding observation).

Diagnosis. – *M. taniniensis* can be distinguished from other species of the *alagozicus* group by the relatively very large, rather quadrate anterior surstyle lobe and the double ridges on the posterior surstyle lobe.

Period of flight and distribution (fig. 100). – Known from the central and southern parts of eastern Turkey where it has been collected in June.

Etymology. – The epitheton *taniniensis*, an adjective, refers to the Tanin-Tanin pass, the type locality of the species in south-eastern Turkey.

Merodon toscanus sp. n.

(figs. 74 a-c, 99)

Type-material: ♂ Holotype 'Italia Toscana, Careggi (Firenze) 19-21.v.1986 W. Hurkmans' (ZMAN).

Description

Male. – Head: Antennae brown, antennae 3 with upper margin convex, apex obtuse, antennal ratio 1.6,

vertex angle 20°, ocellar angle 35°; pubescence pale yellow, face metallic blue lustrous, densely whitish pruinose; a dark hair tuft present in ocellar region.

Thorax: Dark, metallic lustrous on katepisternum, anepisternum, anepimeron, lateral dorsum and scutellum; pubescence dull yellow, even, rather sparse; two pairs of rather faint pruinose bands present. Wings clear, halteres, squamae and antisquamae pale yellow.

Legs: All femora dark brown, tibiae orange with distal wide dark bands, tarsi deep orange to brownish; trochanter 3 smooth, femora 3 rather strongly swollen, curved, triangular processus bearing 7 bristles on weakly serrate distal margin.

Abdomen: Rather slender; T II tapering; T IV bulging; colour mainly deep orange, T II bearing connected anterior and posterior dark lunules, T III with deep orange posterior and paler anterior part, T IV deep orange throughout; T II-IV with arcuate moderately wide pruinose bands, just interrupted on T II-III, continuous and laterally recurved on T IV; all S orange, S IV with drop-shaped emargination, strongly vaulted.

Genitalia: Anterior surstyle lobe elongate, rounded, bifid anteriorly, bearing dense short erect yellow even pubescence throughout (sparser posteriorly); connected to base of posterior surstyle lobe by a short stalk; the posterior surstyle lobe low, elongate, bearing an accessory lobe with dense long erect pubescence medially; its anterior part bald, lustrous, approximately ovoid, its posterior part with sparse yellow pubescence, but denser on margins and posteriorly. Cercus large, with dense, erect, yellow, long pubescence. Aedeagus very slender, with large paired basal humps on outer face; apical shaft part much lengthened; fringed plates on thecal apex suberect, rather narrow.

Body length 12 mm.

Female. – Unknown (see preceding observation).

Diagnosis. – *M. toscanus* has an accessory lobe on the posterior surstyle lobe and a bald anterior part of the posterior surstyle lobe not found in the other species of the *alagozicus* group. The bifid anterior surstyle lobe is much stronger than in *taniniensis*.

Period of flight and distribution (fig. 99). – The unique holotype was collected in May in Toscana, Italy.

Etymology. – The species has been named after Toscana, the region where the holotype was collected. An adjective.

REMAINING SPECIES

Two of the three species discussed under this heading are known only after female specimens. Since these species share character states considered apomorphic for some species treated in this paper, they are discussed here. Of the third species, *M. viaticus* no material was examined, but according to its description it might occupy a position close to some of the species treated in this paper.

Merodon affinis Gil Collado

Merodon affinis Gil Collado, 1930: 243, 255. Holotype ♀: 'Escorial, Arias Encobet, vii.1905' [probably El Escorial, Madrid] (IEE) [examined].

Merodon affinis; Peck 1988: 166.

Description

Female. – In many respects the female *affinis* is similar to *avidus*, with following differences. Head: According to the original description, antenna 3 slightly curved, antennal ratio 2.0, apex acute (antenna 3 missing on the holotype on both sides). Legs: Femora 3 with distal margin of triangular processum much stronger serrate than in *avidus*. Abdomen: Outline triangular, pruinose bands narrowly interrupted, less arcuate than in *avidus*.

Body length 12 mm.

Male. – Unknown.

Discussion. – Because of several differences in the females, *affinis* cannot simply be regarded a synonym of *avidus*, especially not in absence of the males. The status of this species remains uncertain. In view of the mentioned similarities with the females of *avidus*, *affinis* could conceivably belong to the *avidus* group but to e.g. the *alagozicus* or *nigritarsis* group as well.

Period of flight and distribution. – Known only from the holotype, collected in central Spain in July.

Merodon aureotibia sp. n.

(fig. 106)

Type-material: ♀ Holotype 'Turkey, Adiyaman, Nemrut Dağları, 1.vi.1983, leg. M. Kuhbandner' (ZMAN). Paratypes: 3 ♀ 'Tk [Turkey] 5-6-1988 10 km S. Ankara leg. Warncke' (JLR).

Description

Female. – Head: Antennae bright orange, antenna 3 rather broad in outline, apex subacute, upper margin straight, arista long, suddenly tapering, antennal ratio 2.8; pubescence golden; lustrous midstripe occupying 1/3 of width, ocellar region showing dark

pubescence; ocellar angle 70°, lateral ocelli larger than central ocellus; pubescence on compound eyes rather thin, whitish.

Thorax: Rather narrow, black with weak bluish lustre on katapisternum, anepisternum, anepimeron, lateral scutellum and dorsum, with four longitudinal yellow pruinose bands on dorsum, coalescent anteriorly; pubescence rather short, erect, uneven, golden yellow, but darker, brownish in interalar band. Wings clear; halteres, squamae and antisquamae pale yellow.

Legs: All orange except coxae and trochanteres brownish; femora 3 swollen, rather straight, bearing 6 bristles on normal triangular processum.

Abdomen: Rather slender, dark with micaceous lustre; T II bearing large orange lateral spots, T II-IV with slightly arcuate, moderately wide, interrupted, golden pruinose bands combined with golden pubescence; pubescence concolorous otherwise, but yellow laterally and on posterior fringe of T III-IV; T V far projecting, rounded posteriorly.

Body length 11 mm.

Male. – Unknown.

Diagnosis. – *M. aureotibia* can be distinguished from all other females of *Merodon* by its extensively orange leg coloration.

Period of flight and distribution (fig. 106). – This species occurs in June in central and south-eastern Turkey.

Discussion. – In view of the unique leg coloration, the narrow thorax and striking golden pubescence on especially head and abdomen *aureotibia* has been described as a new species. It is reminiscent of females of *aberrans* but differs from it by the leg colour, shape and colour of the antennae, narrower thorax and conspicuous orange lateral spots on T II. Moreover the femora 3 in *aureotibia* are more swollen.

In the coloration of the legs the females of *aureotibia* resemble *vandergooti*, known only after males. Reasons for not considering *aureotibia* as the female sex of *vandergooti* are: (1) *aureotibia* has obtuse antennae, orange and slightly swollen hind femora, arcuate pruinose bands not obliquely placed and a serrate distal triangular processum margin with 6-7 bristles, (2) *vandergooti* has acute antennae, dark and enormously swollen hind femora, oblique bands and a hardly serrate distal triangular processum bearing 10-13 bristles.

These differences are far too great and of a wrong type to be considered as sexual dimorphism.

In view of the slender habitus, relatively long antenna 3 with suddenly tapering arista, *aureotibia* might possibly be related to the *longicornis* group. However, none of the species in that group has

orange legs and relatively wide pruinose bands, whereas *aureotibia* lacks the typical crimson abdominal colour of the *longicornis* group.

Merodon viaticus Fabricius

Merodon viaticus Fabricius, 1805: 197. Lectotype, sex unknown (here designated): 'viaticus', [the upper half of a thorax with basal wing fragments attached] in Sehestedt & Tønder Lund coll. (ZMUC) [examined].

Merodon viaticus; Wiedemann in Meigen 1822: 364; Macquart 1828: 296; Rondani 1845: 258; Walker 1849: 598; Schiner 1857: 414.

Lampetia viatica; Sack 1931: 327.

Material examined. – Paralectotype, sex unknown 'viaticus' [part of a thoracic dorsum] in Kieler coll. (ZMUC).

Description

The size of the thoracic dorsum indicates an overall size of about 12 mm. The background coloration is dark, pubescence largely rubbed off, but where remaining, erect and whitish; pruinose bands rather clear. Wing fragments clear, brown veined.

Discussion. – The original description by Fabricius (1805) does not mention the sex of the fly described. As however a dark median line on the frons is mentioned it must have been a female. The habitus should be similar to that of *annulatus* which is a synonym of *natans*. Stated differences with *viaticus* are the all dark abdomen in *natans* (with a red base in *viaticus*), the all dark legs and smaller size, averaging 9 mm for *natans*.

Wiedemann (in Meigen 1822) gives an extensive description of *viaticus*, in which the abdomen is said to be red on T I II and anterior T III; size is given by Wiedemann as 5 to 6 lines, i. e. 10.5 to 12.2 mm. Wiedemann's description is considered to include both sexes as he comments on differences in the colour of antennae and tarsi between sexes.

Some specimens from Sicily, leg. Schiødte, labelled 'viaticus', without any further data (ZMUC) have been re-identified as *elegans* sp. n.; differences with the description of *viaticus* are the size (14 mm), much swollen femora 3 (not mentioned in either of the descriptions); legs yellow, not reddish or rusty brown-yellow as in the descriptions; abdomen dark brown with extensive yellow coloration, not red, orange or purplish as in descriptions.

M. viaticus is assigned a place in the section of *Merodon* containing the species with arcuate pruinose bands since these are mentioned in the original description.

As there are no females of species in this section of *Merodon* with a cupreous lustre on the abdomen and at the same time partially dark, partially orange legs,

viaticus cannot be synonymized with any of the species. It was listed by Sack (1931: 327) as a synonym of *spinipes* (= *avidus*); no reasons for this synonymy were given.

ANNOTATED LIST OF SPECIES DISCUSSED IN THIS PAPER

Abbreviations used to describe status: H = Holotype examined; ? = Type material not located, not examined; S = syntype(s) examined; P = paratype(s) examined; L = lectotype examined (here designated); PL = paralectotype(s) examined.

	Deposition	Status	Ann
<i>distinctus</i> assemblage			
<i>biarcuatus</i> Curran, 1939	AMNH	H	–
<i>clunipes</i> Sack, 1913	ZMHB	H	–
<i>distinctus</i> Palma, 1863	?	?	1
<i>dimorphus</i> (Szilady, 1940) syn. n.	TMA	[lost]	2
<i>femoratus</i> Sack, 1913	?	S?	3
<i>mariae</i> sp. n.	ZMAN	H, P	–
<i>ottomanus</i> sp. n.	ZMAN	H, P	–
<i>testaceoides</i> sp. n.	RMNH, ZMAN	H, P	–
<i>alexexi</i> group			
<i>alexexi</i> Paramonov, 1925	PC	[lost]	4
<i>altinosus</i> sp. n.	ZMAN	H	–
<i>hirsutus</i> Sack, 1913	NHFW	L, PL	–
<i>hypochrysos</i> sp. n.	ZMAN	H, P	–
<i>kawamurae</i> Matsumura, 1916	?		5
<i>micromegas</i> (Hervé-Bazin, 1929) syn. n.	MNHN, BMNH	L, PL	5
<i>marginicornis</i> sp. n.	ZMAN	H	–
<i>rufitarsis</i> Sack, 1913 stat. nov.	ZMHB	H	–
<i>sophron</i> sp. n.	BMNH	H	–
<i>tener</i> Sack, 1913	DEIC	L, PL	6
<i>trizonus</i> (Szilady, 1940)	TMA	[lost]	2
<i>tarsatus</i> group			
<i>ankylogaster</i> sp. n.	RMNH	H, P	–
<i>auronitens</i> sp. n.	ZMAN	H	–
<i>caudatus</i> Sack, 1913	FIS	[lost]	3
<i>oidipous</i> sp. n.	ZMAN	H, P	–
<i>persicus</i> sp. n.	RMNH	H	–
<i>tangerensis</i> sp. n.	MNHN	H	–
<i>tarsatus</i> Sack, 1913	ZMHB	H	–
<i>smirmovi</i> Paramonov, 1926 syn. n.	PC	[lost]	4
<i>turkestanicus</i> Paramonov, 1926	PC	[lost]	4
<i>xanthipous</i> sp. n.	ZMAN	H, P	–

clavipes group

<i>aberrans</i> Egger, 1860	NHFW	L, PL	–
<i>knerii</i> Mik, 1867	NHFW?	S?	–

<i>obscuripennis</i> Palma, 1863	?	S?	1	avidus group			
<i>aberrans</i> ssp. <i>flavitibius</i> Paramonov, 1925	PC	[lost]	4	<i>avidus</i> (Rossi, 1790)	ZMHB	[lost]	9
<i>aberrans</i> ssp. <i>isperensis</i> ssp. n.	ZMAN	H, P	—	<i>spinipes</i> (Fabricius, 1794)	ZMUC	L	11
<i>brevis</i> Paramonov, 1925	PC	H	—	<i>serrulatus</i> Wiedemann in Meigen, 1822	NHMW	L	—
<i>clavipes</i> (Fabricius, 1781)	ZMUC	L	—	<i>italicus</i> Rondani, 1845	LSF	L, PL	—
<i>canipilus</i> Rondani, 1865	LSF	L	—	<i>rufitibius</i> Rondani, 1845	LSF	L, PL	—
<i>clauda</i> (Villers, 1789)	?	?	7	<i>graecus</i> Walker, 1852	BMNH	L	—
<i>curvipes</i> (Gmelin, 1790)	?	?	8	<i>aurifer</i> Loew, 1862	ZMHB	L	—
<i>gravipes</i> (Rossi, 1790)	?	?	9	<i>quadrilineatus</i> Lioy, 1864 nom. nud.	—		12
<i>sacki</i> Paramonov, 1937 syn. n.	ZSMB	L, PL	—	crassifemoris group			
<i>senilis</i> Meigen, 1822	MNHN	L	—	<i>crassifemoris</i> Paramonov, 1925 comb. n.	PC	[lost]	4, 13
<i>clavipes</i> var. <i>albus</i> Paramonov, 1927	PC	[lost]	4	elegans group			
<i>clavipes</i> var. <i>ater</i> Paramonov, 1927	PC	[lost]	4	<i>bequaerti</i> sp. n.	MNHN	H, P	—
<i>clavipes</i> var. <i>niger</i> Paramonov, 1927	PC	[lost]	4	<i>elegans</i> sp. n.	ZMAN e. a.	H, P	14
<i>cupreus</i> sp. n.	ZMAN, JLR	H, P	—	<i>manicatus</i> (Sack, 1938)	HLMD	H, P	—
<i>dzhaliatae</i> Paramonov, 1926	PC	[lost?]	4	<i>testaceus</i> Sack, 1913	NHMW	L, PL	—
<i>hamifer</i> Sack, 1913	NHMW, DEIC	L, PL	—	alagoezicus group			
<i>karadaghensis</i> Zimina, 1989	Moscow	—	—	<i>alagoezicus</i> Paramonov, 1925	PC	[lost]	4
<i>lusitanicus</i> sp. n.	ZMAN, JLR	H, P	—	<i>lucasi</i> sp. n.	ZMAN, JLR	H, P	—
<i>quadrinotatus</i> (Sack, 1931)	FIS	[lost]	3	<i>nitidifrons</i> sp. n.	ZMAN	H	—
<i>splendens</i> sp. n.	LAU	H	—	<i>satdagensis</i> sp. n.	ZMAN, JLR	H, P	—
<i>velox</i> Loew, 1862	NHMW	L, PL	—	<i>schachti</i> sp. n.	ZMAN, JLR	H, P	—
<i>velox</i> var. <i>anathema</i> Paramonov, 1925	PC	[lost]	4	<i>taniniensis</i> sp. n.	ZMAN, JLR	H, P	—
<i>velox</i> var. <i>armeniacus</i> Paramonov, 1925	PC	[lost]	4	<i>toscanus</i> sp. n.	ZMAN	H	—
<i>warneckei</i> sp. n.	ZMAN, JLR	H, P	—	Remaining species			
pruni group				<i>affinis</i> Gil Collado, 1930	IEE	H	—
<i>pruni</i> (Rossi, 1790)	ZMHB	[lost]	9	<i>aureotibia</i> sp. n.	ZMAN	H	—
<i>fulvus</i> Macquart, 1834	?	?	10	<i>viaticus</i> (Fabricius, 1805)	ZMUC	L, PL	15
<i>fuscinervis</i> Von Röder, 1887	?	?	10				
<i>pallida</i> Macquart, 1842	MNHN	L, PL	—				
<i>sicanus</i> Rondani, 1845	LSF	L, PL	—				
<i>pruni</i> var. <i>obscurus</i> Gil Collado, 1929	IEE	H	—				
longicornis group							
<i>erivanicus</i> Paramonov, 1925	PC	[lost]	4				
<i>kaloceros</i> sp. n.	ZMAN, JLR	H, P	—				
<i>longicornis</i> Sack, 1913	NHMW	L	—				
vandergooti group							
<i>vandergooti</i> sp. n.	ZMAN, JLR	H, P	—				
nigritarsis group							
<i>femoratoides</i> (Paramonov, 1925) comb. n.	ZMHB	L, PL	4				
<i>nigritarsis</i> Rondani, 1845	LSF	L, PL	—				

Annotations

1. The types from the Palma collection have not been located. The descriptions and drawings provided by Palma (1863) of *obscuripennis* and *distinctus* are extensive enough to be used for diagnostic purposes. Sack (1931) has been followed in considering *obscuripennis* synonymous with *aberrans*.

2. The type-material, formerly at TMA, is lost (Dr. A. Dély-Draskovits, in litt.).

3. The holotypes of *caudatus* and *quadrinotatus*, and the syntypes of *M. femoratus*, all formerly in Sack's private collection, were bequeathed to the Forschungsinstitut Senckenberg, Frankfurt/ Main. According to Dr. W. Tobias, curator of Syrphidae in the said museum, no Sack types of any *Merodon* are currently there. When Sack left his collection to SMF the material was presumably still stored in his own house which was plundered shortly after World War II. All Sack types of *Merodon* left to the Senckenberg Museum are therefore to be considered lost.

4. Many type-specimens from the S. J. Paramonov collection have not been located. According to Liepa (1969) most of the types originally in that collection are lost. Some material which probably originated from that collection has been found in ZMHB, including type-material of *Merodon femoratooides* and *M. crassifemoris*. Dr O. G. Ovchinnikova of the USSR Academy of Sciences (St. Petersburg) informed me that some types from the Paramonov collection might still be preserved at the Kiev Zoological Museum. This is also the view of Dr. Y. Nekrutenko, Kiev (pers. comm.). Regrettably this cannot be confirmed. The type of *M. smirnovi* should be stored in the Zoological Institute, Moscow University but this also could not be confirmed.

Reliably identified material, in some cases det. S. J. Paramonov, was present of the following species: *alagozicus* (ZMAN); *alexjei* (KBIN); *brevis* (KBIN); *crassifemoris* (ZMHB); *erivanicus* (ZMAN); *femoratooides* (ZMHB) and *turkestanicus* (ZMAN). No material which can be reliably assigned to *smirnovi* is known; in view of its description this species is here considered synonymous with *tarsatus*.

5. The deposition of the type(s) is not mentioned in Matsumura's original publication. After Horn & Kahle (1936) the Matsumura collection is at the University of Sapporo. Following enquiry to the department of Entomology, Hokkaido University, Sapporo, the presence of the types of *M. kawamurae* there cannot be confirmed. The type(s) (sex and number unknown) originate from Kumamoto, Kyushu. However, this is the name of both a city and an extensive district. The description of the species presented here is based on 2 ♀, 2 ♂ from Harima [inland sea of Japan at 34° 30' N, 134° 30' E], in BMNH and fully complying with the original description.

6. Only female type-specimens have been examined, no male types have been found. The male from Saratow, formerly preserved at TMA, is lost (Dr. A. Dély-Draskovits, in litt.). The male and female syntypes from the Becker collection are not at ZMHB and have not been located elsewhere. A male type from Uralsk, stated in the original publication to be in NHMW, was not found there during a visit in 1987. The 2 female syntypes from which the lectotype has been designated are stored in DEIC, Eberswalde.

7. This species has been described without mention of material, although it is stated by Villers (1789) that *Musca clauda* occurs in Europe, in Bressia [= Brescia].

8. *Musca curvipes* Gmelin is directly referred to Fabricius' original description of *Syrphus clavipes* by

Gmelin (1790). Therefore type-material of this taxon does not exist.

9. No type-material of *Syrphus gravipes*, *Syrphus pruni* or *Syrphus avidus* has been located. After Horn & Kahle (1936) the Rossi collection was transferred to ZMHB; after Dr. H. Schumann (in litt.) no Rossi types of *Merodon* are currently present there.

10. No material was examined of *fulvus* Macquart or *fuscinervis* Von Röder. Both original descriptions suggest a great similarity to *pruni*. Both species were listed by Peck (1988) as synonyms of *pruni*. This synonymy has been followed.

11. The type-material of *spinipes* consists of a single, quite completely decayed probable syntype in ZMUC. This taxon is here synonymized with *avidus* on the ground of complete compliance of the descriptions and figures throughout the literature, starting from the first publications. It must of course be borne in mind that Rossi or Fabricius may have been describing any species of the large group externally resembling *avidus*.

12. No type-material of this taxon was probably ever in existence, as Liroy, after Horn & Kahle (1936) did only theoretic systematic work.

13. The holotype has not been located (see annotation 1). In ZMHB a specimen dating from 1929, with a label attached marking it as a type, was found. As this specimen was collected after the publication of var. *crassifemoris* it is not available as a type specimen; however the labels are in Paramonov's handwriting. The specimen fully complies with the description of the var. *crassifemoris*. It is therefore available as a check on identifications.

14. A large number of paratypes spread over many institutions was designated to facilitate genital study. This was done since *elegans* externally resembles *avidus* and could well be confused with it.

15. The two syntypes from ZMUC, one from the Kieler coll. and one from the Sehestedt and Tønder Lund coll., are so seriously damaged that no conclusion can be drawn as to the status of this species. No other material identified as *viaticus* and complying with the description of that species has been found. Therefore the descriptions given are the only base for identification.

ANNOTATED LIST OF SPECIES EXCLUDED FROM
MERODON

The status of the species described by Walker (1849, 1852, 1857a, 1860) is not clear in all cases. As not all material was available, the specimens studied have been referred to as type-specimens. The present author does not intend to designate lectotypes of species excluded from *Merodon*.

Merodon angustiventris Macquart, 1855: 90. Lectotype ♂ (designated by Thompson 1988) (BMNH) [examined] not considered to belong to *Merodon* in view of morphology of femur 3 and wing venation. According to Thompson (1988) the lectotype belongs to *Quichuana angustiventris* (Macquart), a species occurring in the Neotropical region.

Merodon balanus Walker, 1849: 600. A ♂ type-specimen (BMNH) [examined] belongs to the genus *Mallota* in view of femur 3 and wing venation. Specimen originates from New York [Nearctic region, U. S. A.] where a natural occurrence of *Merodon* is unknown.

Merodon bardus Say (in Walker 1849: 598). The ♂ type-specimen [examined] does not belong to *Merodon*. After Osten-Sacken (1878: 135) this specimen belongs in *Mallota*.

Merodon bautias Walker, 1849: 600. Two syntypes, ♂ and ♀ (BMNH) [examined]. Both syntypes originate from Georgia, United States. The facial knob and wing venation are not compatible with *Merodon*. After Osten-Sacken (1878: 135) this species belongs in *Mallota*.

Merodon bicolor Walker, 1852: 243 [type-material not examined]. In the original description 'feelers' [interpreted as antennae] are stated to possess six joints, therefore the species is considered not to belong to the Syrphidae. The type-material originated from Brazil [Neotropical region] where *Merodon* species do not naturally occur.

Merodon bipartitus Walker, 1849: 599. The ♀ type-specimen (BMNH) originates from Georgia, United States [examined]. In view of the wing venation, this species probably belongs to *Mallota*. See Osten-Sacken (1878: 135).

Merodon chiragra Fabricius, 1805: 198 [type-material not examined]. Not included in a shipping of all other available *Merodon* types from ZMUC; this species belongs in *Sphegina*.

Merodon coerulea Becker, 1912: 602 [type-material not examined]. On the basis of the original description this species belongs in *Eumerus*.

Merodon contrarius Walker, 1849: 599. Both ♂ and ♀ type-specimens (BMNH) [examined]. This material originated from New Holland and belongs to *Orthoprosopa grisea* (Walker).

Merodon edentulus Macquart, 1855: 90. Holotype,

♀ from Cape of Good Hope [not examined]; a ♀ non type (BMNH) dating from XIX century identified as *edentulus* [examined] belongs to *Mallota*. The original description mentions a facial knob, unknown in *Merodon*.

Merodon interveniens Walker, 1860: 120. ♂ Type-specimen (BMNH) [examined]. This specimen originated from Macassar [Sulawesi] and does not belong in *Merodon* in view of wing venation, shape of leg 3 etc.

Merodon melota Seguy, 1941: 13. ♀ Holotype from Agadir, Morocco (MNH) [examined]. This species belongs to *Eumerus*.

Merodon morosus Walker, 1849: 599. A ♀ type-specimen (BMNH) [examined]. This does not belong to *Merodon* but according to Osten-Sacken (1878: 135) is *Polydontomyia curvipes* O.-S.

Merodon ornatus Brunetti, 1915: 232. Holotype in Indian Museum, Calcutta [not examined] could not be shipped in view of its conservation state. After original description the wings have a brown stigma, there is no triangular processus on the femur 3 and the face is projecting; therefore this species is considered not to belong to *Merodon*.

Merodon scutellaris Shiraki, 1968: 200. [Type-material not examined]. From the description and photographed holotype it can be concluded that this species belongs to the genus *Azpeytia*.

Merodon tenebricus Walker, 1849: 601. Lectotype ♀ (designated by Thompson 1988) (BMNH) [examined]. In view of the shape of femur 3 and wing venation this species does not belong to *Merodon*. The identification as *Palpada furcata* was given by Thompson (1988: 220).

Merodon torpidus Walker, 1857a: 152. Lectotype ♂ (designated by Thompson 1988) (BMNH) [examined]. This does not belong to *Merodon* given the shape of femur 3 and wing venation. The identification as *Orthoprosopa grisea* Walker was given by Thompson (1988: 220).

Merodon tuberculatus Brunetti, 1923: 214. The types, in the Indian Museum, Calcutta, [not examined] were too fragile to be shipped; the description of this species was based on that of *Helophilus tuberculatus*. The description and the figures (Brunetti, 1908) make clear that this species does not belong to *Merodon*.

Merodon umbrifer Walker, 1849: 601. The ♂ type-specimen from Sierra Leone does not belong to *Merodon* in view of leg morphology and wing venation.

Merodon varicolor Walker, 1857b: 122. The ♂ type-specimen from Borneo, in BMNH, belongs to *Mallota* in view of the shape of femur 3 and the wing venation pattern.

Proposal of *Azpeytia shirakii* nomen n. for *Merodon scutellaris* Shiraki, 1968

Since *Merodon scutellaris* Shiraki is incorrectly assigned to *Merodon* (see above), it is here proposed to transfer this taxon to *Azpeytia*, where it clearly belongs. As there already exists an *Azpeytia scutellaris*, published by Walker (1857b: 113), the epitheton of the species described by Shiraki, when transferred to *Azpeytia*, must be changed; the nomen novum *Azpeytia shirakii* is hereby proposed for this taxon.

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REFERENCES

- Aubert, J., J.-J. Aubert & P. Goeldlin, 1976. Douze ans de captures systématiques de Syrphides (Dipteres) au Col de Bretolet (Alpes Valaisannes). – *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 49: 115-142.
- Barendregt, A., 1982. *Zweefvliegtabel* (7th Ed.) – Jeugdbondsuitgeverij Amsterdam, 83 pp.
- Becker, Th., 1907. Die Ergebnisse meiner Dipterologische Frühjahrsreise nach Algier und Tunis 1906. – *Zeitschrift für Hymenopterologie und Dipterologie* 7: 225-256.
- Becker, Th., 1912. Persische Dipteren der Expedition des Herrn M. Zarudny 1898 und 1901, unter Mitwirkung von P. Stein. – *Annales de l'Académie des Sciences de St. Petersburg* 17: 503-652.
- Becker, Th., 1921. Neue Dipteren meiner Sammlung. – *Mitteilungen des Zoologischen Museum Berlin* 10: 1-93.
- Bankowska, R., 1980. Fly communities of the family Syrphidae in natural and anthropogenic habitats of Poland. – *Memorabilia Zoologica* 33: 3-93.
- Bezzi, M., 1895. Contribuzioni della Fauna Ditterologica Italiana I: Ditteri della Calabria. – *Bollettino della Società Entomologica Italiana* 27: 39-78.
- Bezzi, M., 1900. Contribuzioni della Fauna Ditterologica Italiana II: Ditteri delle Marche e degli Abruzzi A: Osservazioni ed Aggiunte ai due fascicoli precedenti. – *Bollettino della Società Entomologica Italiana* 32: 77-102.
- Bradescu, V., 1986. Etudes Diptérologiques (Syrphidae) dans la Réserve Naturelle Domogled Valée de la Cerna. – *Travaux du Musée d'Histoire Naturelle 'Grigore Antipa'* 28: 121-131.
- Brown, E. S., 1951. Variation and Polymorphism in *Lampetia equestris* (F.) (Dipt., Syrphidae) and other British insects. – *Entomologists' Monthly Magazine* 87: 16-18.
- Brunetti, E., 1907. Notes on Oriental Syrphidae with descriptions of new species. – *Records of the Indian*

- Museum I: plates I-XIII.
- Brunetti, E., 1908. Notes on Oriental Syrphidae with descriptions of new species. – Records of the Indian Museum 2: 49-96.
- Brunetti, E., 1915. Notes on Oriental Syrphidae, with descriptions of new species part II. – Records of the Indian Museum 11: 201-256.
- Brunetti, E., 1923. Pipunculidae, Syrphidae, Conopidae, Oestridae. – Fauna of British India including Ceylon and Burma, Diptera III: xi + 424 pp.
- Conn, D. L. T., 1978. Morphological and behavioural differences in populations of *Merodon equestris* (F.) (Diptera: Syrphidae). – Entomologists' Monthly Magazine 114: 65-66.
- Coquillett, D. W., 1910. The type-species of the North American genera of Diptera. – Proceedings of the United States National Museum 37: 499-647.
- Curran, C. H., 1939. Records and descriptions of African Syrphidae III (Diptera). – American Museum Novitates 1025: 1-11.
- Czerny, L. & G. Strobl, 1909. Spanische Dipteren III. – Beiträge zur Verhandlungen der Kaiserlichen Königlischen Zoologisch-Botanischen Gesellschaft in Wien 59: 121-301.
- Delfinado, M. D. & D. E. Hardy, 1975. Catalog of the Diptera of the Oriental Region. – x + 459 pp.
- Egger, J., 1860. Fortsetzung der Beschreibung neuer Zweiflügler und Diagnostische Bemerkungen. – Verhandlungen der Kaiserlichen Königlischen Zoologisch-Botanischen Gesellschaft in Wien 10: 663-665.
- Fabricius, J. C., 1781. Species Insectorum exhibentes eorum differentias specificas, Synonyma auctorum, loca natalia, metamorphosis adjectis observationibus, descriptionibus vol. 2. – Hafniae [Copenhagen]. 382 pp.
- Fabricius, J. C., 1794. Entomologia Systematica emendata et aucta vol. 4. – Hafniae [Copenhagen]. 427 pp.
- Fabricius, J. C., 1805. Systema Antliatorum secundum Ordines, Genera et Species. – Brunsviquiae [Braunschweig, F. R. G.]. 373 pp.
- Fitzpatrick, S. M. & W. G. Wellington, 1983. Contrasts in the territorial behavior of three species of hoverflies (Diptera: Syrphidae). – Canadian Entomologist 115: 559-566.
- Gaunitz, Sv., 1969. Studien über die Unterfamilie Eristalinae. – Entomologisk Tidskrift 90: 73-99.
- Gil Collado, J., 1929. Sirfidos de Marruecos del Museo de Madrid (Dipt. Syrph.). – Memorias de la Real Sociedad Español de Historia Natural 12: 403-415.
- Gil Collado, J., 1930. Monografía de los Sirfidos de España. – Trabajos del Museo Nacional de Ciencias Naturales de Madrid (Zoología) 54: vii + 1-376.
- Glumac, S., 1958. The structure of the male genitalia of certain species of flowerflies (Syrphidae, Diptera) and their significance in phylogenetical classification. – Glasnik Priroda Museu Srpske Zemlje (B) 12: 77-167 [in Serbo-Croatian, with English Summary].
- Gmelin, J. F., 1790. Caroli a Linne, Systema Naturae per Regna tria Naturae, editio 13 vol. 1 Regnum Animale, 5: 2225-3020. – Lipsiae [Leipzig].
- Goot, V. S. van der, 1964a. Summer records of Syrphidae (Diptera) from Sicily, with field notes and descriptions of new species. – Zoologische Mededelingen, Leiden 39: 414-432.
- Goot, V. S. van der, 1964b. Fluke's catalogue of neotropical Syrphidae (Insecta, Diptera), a critical study with an appendix on new names in Syrphidae. – Beaufortia 10: 212-221.
- Goot, V. S. van der, 1971. Enkele naamsveranderingen bij Nederlandse Syrphiden en nog enkele opmerkingen. – Entomologische Berichten, Amsterdam 31: 105-110.
- Goot, V. S. van der, 1981. De Zweefvliegen van Noordwest Europa en Europees Rusland, in het bijzonder van de Benelux. – Amsterdam. 275 pp.
- Goot, V. S. van der & J. A. W. Lucas, 1964. Aantekeningen over Nederlandse Syrphiden. – Entomologische Berichten, Amsterdam 24: 3-13.
- Heiss, E. M., 1938. Classification of the larvae and puparia of the Syrphidae of Illinois exclusive of aquatic forms. – Illinois Biological Monographs 16 (4): 1-66.
- Hervé Bazin, J., 1929. Un nouveau *Lampetia* (*Merodon*) de Chine (Dipt. Syrphidae). – Bulletin de la Société Entomologique de France 69: 111-115.
- Horn, W. & I. Kahle, 1936. Über Entomologische Sammlungen, Entomologen und Entomo-Museologie (Ein Beitrag zur Geschichte der Entomologie). – 535 pp. Berlin.
- Hull, F. M., 1949. The morphology and inter-relationship of the genera of syrphid flies, recent and fossil. – Transactions of the Zoological Society of London 26: 257-408.
- Hurkmans, W. E. G., 1985. Territorial behaviour of two *Merodon* species (Diptera: Syrphidae). – Entomologische Berichten, Amsterdam 45: 69-70.
- Hurkmans, W., 1988. Ethology and ecology of *Merodon* in Turkey (Diptera: Syrphidae). – Entomologische Berichten, Amsterdam 48: 107-114.
- International Commission on Zoological Nomenclature, 1963. Opinion 678. – Bulletin of Zoological Nomenclature 20: 339.
- Kabos, W. J., 1939. Over de biologie van *Merodon equestris* Fabr. (Narcisvlieg). – Entomologische Berichten, Amsterdam 10: 136-139.
- Kaplan, M. & F. Christian Thompson, 1981. New Syrphidae from Israel (Diptera). – Proceedings of the Entomological Society of Washington 83(2): 198-212.
- Kertész, K., 1907. Cyclorrhapa Aschiza, Cyclorrhapa Schizophora: Schizometopa. – In: Th. Becker, M. Bezzi, K. Kertész & P. Stein (ed.), Katalog der paläarktischen Dipteren, III: 824 pp.
- Latreille, P. A., [1804]. Histoire naturelle générale et particulière des Crustacés et des Insectes. Ouvrage faisant suite aux oeuvres de Leclercq et Buffon, etc., 4. – Paris, 432 pp.
- Latreille, P. A., 1810. Considérations générales sur l'ordre naturel des animaux composant les classes des crustacés, des arachnides et des Insectes; avec un Tableau méthodique de leurs Genres, disposés en Familles. – Paris. 444 pp.
- Liepa, Z. R., 1969. Lists of the scientific works and described species of the late Dr. S. J. Paramonov, with locations of types. – Journal of the Entomological Society of Australia (New South Wales) 5: 3-22.
- Lindner, E., 1949. Die Larve der Narzissenfliege *Lampetia equestris* FABR. (Diptera: Syrphidae). – Entomon 1: 4-9.
- Liroy, M., 1864. I Ditteri distributi secondo un novo metodo di classificazione naturale. – Atti del Imperiale Regiale

- Instituto Veneto di Scienze, Lettere ed Arte (3) 9: 738-760.
- Loew, H., 1862a. Über Griechische Dipteren. – Berliner Entomologische Zeitschrift 6: 69-89.
- Loew, H., 1862b. Über einige bei Varna gefangene Dipteren. – Wiener Entomologisches Monatschrift 6: 161-175.
- Loew, H., 1869. Beschreibung Europäischer Dipteren I. – Wien. xiv + 310 pp.
- Lundbeck, W., 1916. *Diptera Danica*, genera and species of flies hitherto found in Denmark, vol. 5: *Lonchopteridae*, *Syrphidae*. – Copenhagen, London. ii + 603 pp.
- Macquart, J., 1828. *Insectes Diptères du Nord de la France*, *Syrphides*. – Mémoires du Société des Sciences Agricoles de Lille 1827-1828: 149-371.
- Macquart, J., 1834. *Histoire naturelle des Insectes, Diptères I. – In: Roret, Collection des Suites a Buffon*. Paris. 578 pp.
- Macquart, J., 1842. *Diptères exotiques nouveaux ou peu connus* (2) 2. – Paris. 140 pp.
- Macquart, J., 1849. *Histoire naturelle des animaux articulés, cinquième classe Insectes. – In: Lucas, Exploration scientifique de l'Algérie pendant les années 1840, 1841 et 1842. – Paris*. 527 pp.
- Macquart, J., 1855. *Diptères exotiques nouveaux ou peu connus, 5e Supplement. – Mémoires du Société Impériale des Sciences Agricoles et des Arts de Lille* 1854: 25-156.
- Maldonado Capriles, J. & Angel Berrios, 1977. The immature stages of *Copestylum vacuum* (Diptera: Syrphidae), a new record for Puerto Rico. – Research Note of the Journal of Agriculture of the University of Puerto Rico 61: 395-399.
- Marcos García, M. A., 1985. Los Syrphidae (Dip.) de las Sierras occidentales del sistema central Español, subfamilias *Eristaliinae*, *Lampetiniinae* [sic!], *Microdontinae*, *Milesiinae* y *Cerianinae*. – Boletín de la Asociación Español de Entomología 9: 187-210.
- Marcos García, M. A., 1989. *Merodon escorialensis* Strobl, 1909 stat. nov. (Diptera, Syrphidae) (1). – Annales de la Société entomologique de France, Nouvelle série 25 (2): 243-247.
- Matsumura, S., 1916. *Thousand insects of Japan additamenta II.* – Tokyo. 505 pp.
- McAlpine, J. F. et al., 1981. *Manual of nearctic Diptera* vol. 1. – Ontario. 674 pp.
- Meigen, J. W., 1800. *Nouvelle classification des Mouches a deux ailes, d'apres un plan tout nouveau.* – Paris. 40 pp. [reprinted in *Bulletin of Zoological Nomenclature* 1 (1945): 121-160]
- Meigen, J. W., 1803. *Versuch einer neuen Gattungseintheilung der europäischen Zweiflügeligen Insekten.* – Illiger's Magazin für Insektenkunde 2: 259-281.
- Meigen, J. W., 1822. *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten* 3. – Hamm. x + 416 pp.
- Meigen, J. W., 1830. *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten* 6. *Nachträge und Berichtigungen zum dritten Theile.* – Hamm. 401 + 3 unnumbered pp.
- Meigen, J. W., 1838. *Systematische Beschreibung der bekannten Europäischen zweiflügeligen Insekten* 7. – Hamm. xii + 434 pp.
- Metcalf, C. L., 1921. The genitalia of male Syrphidae, with especial reference to its taxonomic significance. – *Annals of the Entomological Society of America* 14: 169-214.
- Mik, J., 1867. *Dipterologische Beiträge zur 'Fauna Austria'* I. Beschreibung neuer Arten. – Verhandlungen der Kaiserlichen Königlichen Zoologisch-Botanischen Gesellschaft in Wien 17: 413-424.
- Mik, J., 1883. *Dipterologische Bemerkungen I: Synonymisches.* – Verhandlungen der Kaiserlich Königlichen Zoologisch-Botanischen Gesellschaft in Wien 33: 181-192.
- Oldenberg, L., 1919. Die *Lampetia* Arten meiner Ausbeute. – *Deutsche Entomologische Zeitschrift*, Jahrgang 1919: 387-389.
- Osten-Sacken, C. R. von, 1878. *Catalogue of the described Diptera of North America*, 2nd edition. – *Smithsonian miscellaneous collections* vol 16(2): 1-276.
- Palma, G., 1863. *Ditteri della fauna Napolitana. Memoria del socio ordinario Giuseppe Palma.* – *Annali dell' Accademia di Aspiranti Naturalisti di Napoli*, serie 3: 37-66.
- Paramonov, S. J., 1924. Zwei neue Syrphiden Arten (Diptera) aus dem südwestlichen Russland. – *Konowia* 3: 249-252.
- Paramonov, S. J., 1925. Zur Kenntnis der Gattung *Merodon*. – *Encyclopédie Entomologique* (B), 2: *Diptera*, 2, fascicule 3: 143-160.
- Paramonov, S. J., 1926a. Fragmente zur Kenntnis der Dipterenfauna Armeniens. – *Societas Entomologica* 41: 33-34; 38-39; 44; 46-47.
- Paramonov, S. J., 1926b. *Dipterologische Fragmente 5. Über einige Merodon Arten.* – *Bulletin de l'Académie des Sciences de l'Ukraine IV* (4) vol. 2: 317-323 [Also in *Travaux du Musée Zoologique de Kiev* 2: 73-79].
- Paramonov, S. J., 1927. Über einige Arten und Varietäten von Dipteren (Fam. Stratiomyidae et Syrphidae). – *Travaux du Musée Zoologique de Kiev* 2: 87-93.
- Paramonov, S. J., 1929. *Dipterologische Fragmente 19. Über die Gattung Merodon.* – *Travaux du Musée Zoologique de Kiev* 7: 181-195.
- Paramonov, S. J., 1935. *Dipterologische Fragmente* 31, 32. *Wass ist ein echtes Weibchen von Lampetia arripes Rond.?: Die Unterschiedsmerkmale zwischen L. monticola Villeneuve und L. alexei Paramonov; Lampetia monticola Villeneuve ♂.* – *Travaux du Musée Zoologique de Kiev* 15: 163-166.
- Paramonov, S. J., 1937a. Beiträge zur Monographie der Gattung *Lampetia* (*Merodon* olim.), *Syrphidae*, *Diptera*, 1. Teil. – *Travaux du Musée Zoologique de Kiev* 17: 3-13.
- Paramonov, S. J., 1937b. *Dipterologische Fragmente 36. Über einige Lampetia (Merodon) Typen.* – *Travaux du Musée Zoologique de Kiev* 17: 69-77.
- Peck, L. V., 1988. *Syrphidae.* – In: A. Soós (ed.), *Catalogue of Palaearctic Diptera* vol. 8 *Syrphidae*, *Conopidae* pp. 11-230. Amsterdam, etc.
- Portschinsky, I., 1877. *Materiali dlye Istorie Fauny Rossiye e Kavkaza.* – *Trudy Rosskago Entomologicheskago Obshchestva* 10: 102-198.
- Röder, H. von, 1887. *Insekten der Insel Kreta.* – *Berliner Entomologische Zeitschrift* 31: 73-74.
- Rondani, C., 1843. *Dipteres nouveaux d'Italie.* – *Revue Zoologique*, *Fevrier* 1843: 43-44.
- Rondani, C., 1845. *Sulle specie Italiane del Genere Merodon; Memoria decimaquarta, per servire alla Ditterologia Italiana.* – *Nuovi Annali di Società delle*

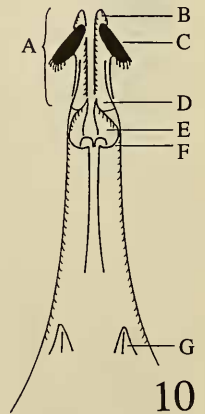
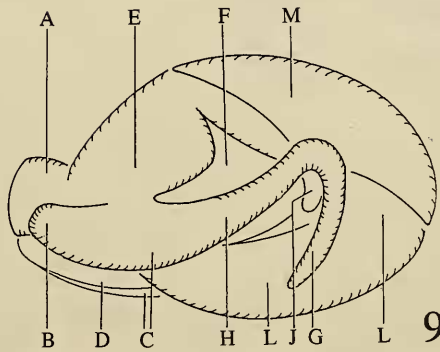
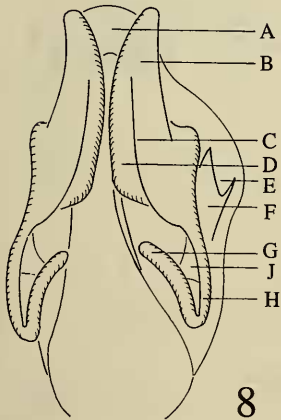
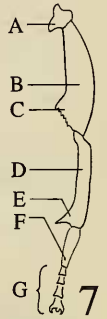
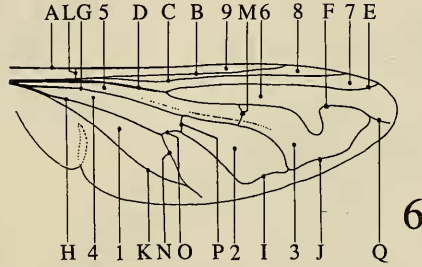
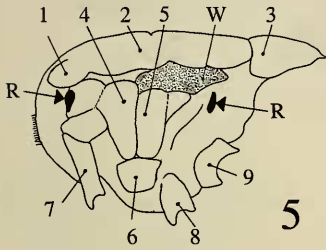
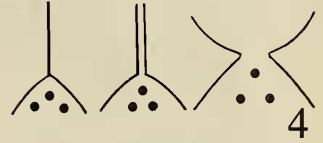
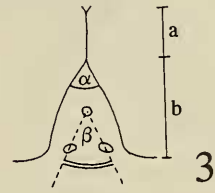
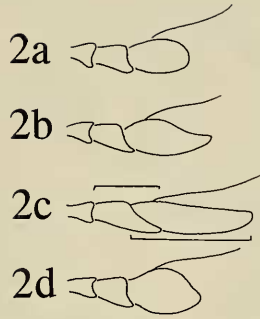
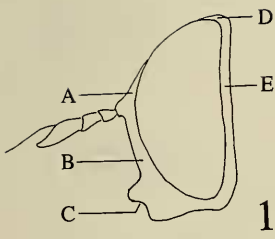
- Scienze Naturale di Bologna, (serie II) 4: 254-267.
- Rondani, C., 1857. *Dipterologiae Italicae Prodrum* II. Species Italicae ordinis dipterorum in genera characteribus definitae, ordinatim collectae, methodo analitica distinctae, et novis vel minus cognitis descriptis, pars I: Oestridae, Syrphidae, Conopidae. – Parma. 264 pp.
- Rondani, C., 1865. *Diptera Italica non vel minus descripta vel annotata observationibus nonnullis additis*, fasciculo 1: Oestridae, Syrphidae, Conopidae. – Atti della Società Italiana delle Scienze Naturale di Milano 8: 127-146.
- Rondani, C., 1868a. *Diptera Italica non vel minus descripta vel annotata observationibus nonnullis additis, species Italicae adde sequentes: Familia II Syrphidae, genere Merodon Latr.* – Atti della Società Italiana delle Scienze Naturale di Milano 11: 22-23.
- Rondani, C., 1868b. *Specierum Italicarum Ordinis Dipterorum Catalogus Geographicus auctus*, fasciculo 1. oestridae, Syrphidae, Conopidae. – Atti della Società Italiana delle Scienze Naturale di Milano 11: 559-575.
- Rondani, C., 1873. Species aliquae in Oriente lecta a Marchese J. Doria, anno 1862 63 Fragmentum II. – *Annali di Museo Civico di Genova* 1873: 295.
- Rossi, F., 1790. Fauna Etrusca, sistens Insecta quae in provinciis Florentina et Pisana praesertim collegit. – Pisa 1-451 (2 vols.).
- Rossi, F., 1794. *Mantissa Insectorum, exhibens species nuper in Erruria collectas adjectis faunae Etruscae illustrationibus ac emendationibus* (2). – Pisa. 154 pp.
- Sack, P., 1913a. Die Gattung *Merodon* Meigen (*Lampetia* Meigen olim.). – *Abhandlungen des Senckenbergische Gesellschaft der Naturforscher* 31: 427-462.
- Sack, 1913b. Zwei neue Paläarktische *Merodon*-Arten. – *Annales Musei Nationalis Hungarici* 11: 620-622.
- Sack, P., 1930. Zweiflügler (Diptera) IV: Schwebfliegen (Syrphidae). – *Tierwelt Deutschlands* 20: 1-118.
- Sack, P., 1931. Syrphidae. – In: Lindner, die Fliegen der paläarktischen Region IV (6): 1-451.
- Sack, P., 1934. *Lampetia crymensis* Paramonov ♀. – *Konowia* 13: 273-274.
- Sack, P., 1938. Zwei neue Syrphiden vom Balkan. – *Konowia* 17: 19-23.
- Schiner, J. R., 1857. *Diptera Austriaca*, Aufzählung aller im Kaisertume Oesterreichs bisher aufgefundenen Zweiflügler, III: die Oesterreichischen Syrphiden. – *Verhandlungen der Kaiserlichen Königlichen Zoologisch-Botanischen Gesellschaft in Wien* 7: 279-506.
- Schiner, J. R., 1862. *Fauna Austriaca, die Fliegen (Diptera)* 1. Theil vi + xlii + 672 pp.
- Séguy, E., 1941. *Dipteres accueillis par M. L. Berland dans le Sud Marocain, Syrphidae.* – *Annales du Société Entomologique de la France* 110: 13-14.
- Séguy, E., 1961. *Dipteres Syrphides de l'Europe occidentale.* – *Mémoires du Musée d'Histoire Naturelle, Nouvelle Série, Série A Zoologie* 23: 1-248.
- Shiraki, T., 1930. Die Syrphiden des Japanischen Kaiserreiches, mit Berücksichtigung der benachbarten Gebiete. – *Memoirs of the Faculty of Agriculture, Taihoku Imperial University* 1: i-xx; 1-446.
- Shiraki, T., 1968. *Fauna Japonica II: Insecta Diptera*, vol III Syrphidae, subfamily Merodontinae (*Lampetinae*): 194-252.
- Speight, M. C. D., 1987. External morphology of adult Syrphidae (Diptera). – *Tijdschrift voor Entomologie* 130: 141-175.
- Stackelberg, A. A. & Richter, V., 1968. Hower-Flies (Diptera: Syrphidae) of the Caucasus. – *Trudy Vsesoyuznogo Entomologicheskogo Obschestva* 52: 224-274.
- Strobl, G., 1893. Beiträge zur Dipterenfauna der Oesterreichischen Littorale. – *Wiener Entomologische Zeitung* 12 (2): 74-408.
- Strobl, G., 1900. Die Dipterenfauna von Bosnien, Hercegovina und Dalmatien. – *Wissenschaftliche Mitteilungen aus Bosnien und der Hercegovina (III. Naturwissenschaft)* 7: 352-670.
- Stuckenberg, B. R., 1956. The immature stages of *Merodon bombiformis* Hull, a potential pest of bulbs in South Africa (Diptera: Syrphidae). – *Journal of the Entomological Society of South Africa* 19: 219-224.
- Šuster, P., 1959. *Diptera, Syrphidae.* – *Fauna Republicis Populare Romine, Insecta II pars III.* Bucuresti. 286 pp.
- Szilady, L., 1940. Über Paläarktische Syrphiden. – *Annales Musei Nationalis Hungarici* 33: 34-70.
- Thompson, F. C., 1988. Syrphidae (Diptera) described from unknown localities. – *Journal of the New York Entomological Society* 96 (2): 200-226.
- Treiber, R., 1987. Beobachtungen zur Ökologie von *Merodon rufus* (Meigen, 1846). – *Naturkundliche Beiträge des DJN* 18: 64.
- Verrall, G. H., 1901. *British Flies*, vol. 3: *Platypozidae, Pipunculidae, Syrphidae of Great Britain*: 17-121 (Catalogue); 127-691. – [reprint E. W. Massey, Faringdon 1969]
- Villeneuve, J., 1903. Contributions au Catalogue des Diptères de France. – *Feuille de la Jeunesse Naturaliste* 33: 113-119.
- Villeneuve, J., 1909. Description d'un nouveau Syrphide. – *Wiener Entomologische Zeitung* 28: 338-339.
- Villeneuve, J., 1910. Notes synonymiques. – *Wiener Entomologische Zeitung* 29: 304-305.
- Villeneuve, J., 1912. Notes synonymiques. – *Wiener Entomologische Zeitung* 31: 96-97.
- Villeneuve, J., 1924. *Dipteres nouveaux.* – *Encyclopédie Entomologique (B)* 2: Diptera 1: 5-8.
- Villeneuve de Jantzi, J., 1934. Notes diptérologiques. – *Revue Française d'Entomologie* 1: 180-181.
- Villers, R., 1789. *Linnaeus, Entomologia, fauna Suecicae descriptionibus aucta, tomus tertius IV Insecta Diptera: Musca* 1-657. – Lugduni [Lyon].
- Violovitsh, N. A., 1983. *Sirfydi Sibiri, Siberian Syrphidae (Diptera).* – *Verslagen en technische gegevens van het Instituut voor Taxonomische Zoologie (Zoologisch Museum), Universiteit van Amsterdam*; [Translated by V. S. van der Goot and L. Verlinden; Foreword and keys only: 2-228. – published in Amsterdam, 1986].
- Walker, F., 1849. List of the specimens of dipterous insects in the collection of the British Museum vol. 3: 485-687.
- Walker, F., 1852. *Insecta Saundersiana, or characters of undescribed insects in the collection of William Wilson Saunders, esq.* – London. 474 pp.
- Walker, F., 1857a. Characters of undescribed Diptera in the collection of W. W. Saunders, esq. – *Transactions of the Entomological Society of London, New Series* 4: 119-157.
- Walker, F., 1857b. Catalogue of the dipterous insects collected at Sarawak, Borneo by Mr A. R. Wallace, with descriptions of new species. – *Journal of the Proceedings of the Linnaean Society, Zoology* vol. 1: 105-136.
- Walker, F., 1860. On Diptera collected at Makassar: *Merodon.* – *Proceedings of the Linnaean Society of London* 4: 120.

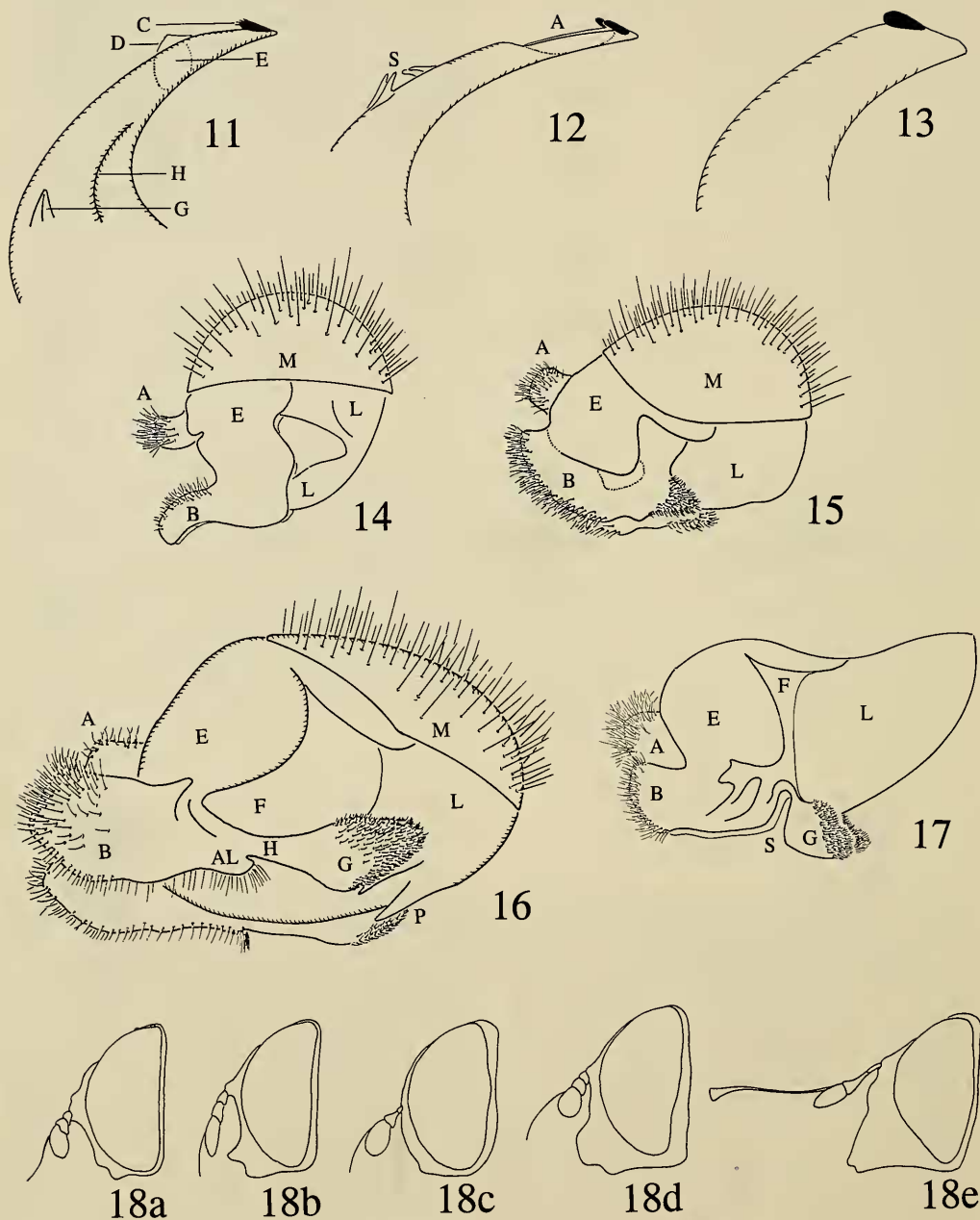
- Westwood, J. O., 1840. An introduction to the modern classification of insects: Synopsis of the genera of British Insects, Order 13: Diptera Aristotle (Antliata Fabricius, Halteriptera Clairv.). – pp. 125-158.
- Zimina, L. V., 1989. Novie Sirfidy Poda *Merodon* (Diptera, Syrphidae) iz Vostozhogo Kryma [New species of the genus *Merodon* (Diptera, Syrphidae) from the east Crimea] – Vestnik Zoologia 1989 no. 1: 24-29. (in Russian).

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Figs. 1-10. General morphology of *Merodon*. – Fig. 1. Lateral view of head. a, face; b, frons; c, oral margin; d, vertex; e, occiput. – Fig. 2. Lateral view of antenna. a, antenna with 3rd article showing convex upper margin, apex rounded; b, 3rd article with upper margin basally convex, apically concave, apex acute; c, 3rd article straight margined, apex subacute; d, 3rd article strongly widened, upper margin convex, incised subapically. Lines above and below mark measured lengths of articles 2 and 3 respectively; the antennal ratio (length 3 : length 2) is often used in descriptions. – Fig. 3. Dorsal view of vertex and frons in ♂. Line portion a marks the length of tl, portion b the vertex height; angle alpha is vertex angle, beta is ocellar angle. – Fig. 4. Dorsal view of vertex and frons. (left), tl complete; (middle), tl incomplete: a linear strip separates the eyes, this condition might be termed subholoptic; (right), eyes separate (this occurs in some species in the ♂, and in all ♀). The ocellar region is hatched. – Fig. 5. Lateral view of thorax (wings and legs omitted). 1, humeral knob; 2, dorsum with suture; 3, scutellum; 4, mesopleuron (katepisternum); 5, pteropleuron (anepisternum); 6, sternopleuron (anepimeron); 7, coxa I; 8, coxa II; 9, coxa III; W, wing insertion area; R, respiratory orifice (trachea). – Fig. 6. Dorsal view of right wing. 1, anal cell (a); 2, discal-medial cell (dm); 3, combined 4th+5th radial cell (r4+5); 4, basal medial cell (bm); 5, basal radial cell (br); 6, 2nd+3rd radial cell (r2+3); 7, 1st radial cell (r1); 8, subcostal cell (sc); 9, costal cell (c); A, Costa (C); B, Subcosta (Sc); C, 1st branch of Radius (R1); D, main branch of Radius (R); E, 2nd & 3rd fused branches of Radius (R2+3); F, 4th & 5th fused branches of Radius (R4+5); G, Media (M); H, anterior Cubital (Cua1); I, discal-medial Cubital (dm-cu); J, apical part of Media (M); K, analis (A); L, humeral (h); M, radial-medial (r-m); N, 2nd anterior Cubital (Cua2); O, basal part of Cua1; P, basal-medial Cubital (bm-cu). – Fig. 7. Lateral view of leg III. a, trochanter (spine shown is present in ♂ of some species only); b, femur, with c, triangular process; d, tibia, with e, apical spur; f, metatarsus; g, tarsus. – Fig. 8. Ventral view of ♂ genitalia (*alagoezicus* group). A, cercus; B, posterior surstyle lobe; C, apical margin of surstyle; D, ridge on inner face (medial face) of surstyle; E, epandrium; F, membranous part of surstyle; G, apical extension of anterior surstyle lobe; H, anterior surstyle lobe; J, accessory lobe. – Fig. 9. Lateral view of ♂ genitalia (*alagoezicus* group). A through J as in fig. 8; L, aedeagus; M, genital cap. – Fig. 10. Ventral view of aedeagus. A, apical shaft part; B, apex aedeagi; C, fringed plates; D, chitinous plates; E, subapical cavity; F, thecal ridge basally bordering same; G, basal humps.





Figs. 11-13. Aedeagus in *Merodon*. – 11, lateral view, lettering as in fig. 10, H, lateral ridge; 12, slender aedeagus with lengthened apical shaft part A; S, paired spines; 13, stout aedeagus with recumbent fringed plates. – Figs. 14-17. Lateral view of ♂ genitalia of *Merodon*, lettering as in Fig. 9. – 14, *M. apimimus*; 15, *M. distinctus*; 16, *M. nigratarsis*; 17, *M. longicornis*. – Fig. 18. Lateral view of head in ♂ of different Syrphidae. – a, *Azpeytia scutellaris* Walker; b, *Merodon avidus*; c, *Eumerus strigatus* Fallen; d, *Malloia takasagoensis* (Matsumura); e, *Platynochaetus armipes* Bezzi.

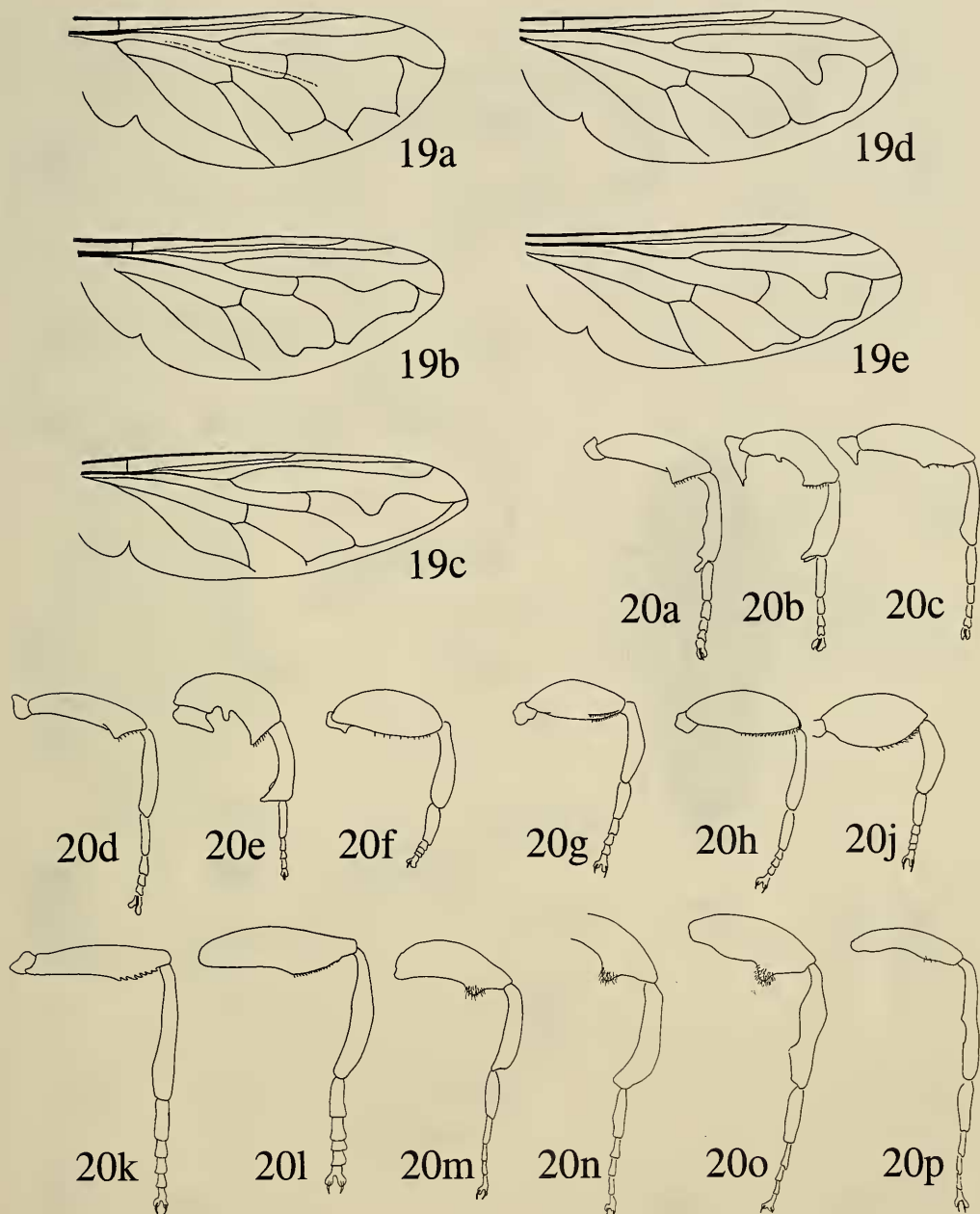


Fig. 19. Dorsal view of right wing in ♂ of different Syrphidae. – a, *Eumerus strigatus* Fallen; b, *Azpeytia scutellaris* Walker; c, *Mallota takasagoensis* (Matsumura); d, *Merodon avidus*; e, *Platynochaetus armipes* Bezzi. – Fig. 20. Lateral view of leg III in ♂ of different Syrphidae. – a, *Merodon equestris*; b, *M. armipes*; c, *M. minutus*; d, *M. aberrans*; e, *M. ruficornis*; f, *Eumerus sulcibius* Rondani; g, *E. tuberculatus* Rondani; h, *E. olivaceus* Loew and *E. nudus* Loew; i, *Eumerus strigatus* Fallen; j, *Eumerus strigatus* Fallen; k, *Azpeytia scutellaris* Walker; l, *Azpeytia shirakii* nomen novum; m, *Mallota cimbiciformis* Fallen; n, *Mallota takasagoensis* (Matsumura); o, *Platynochaetus armipes* Bezzi; p, *Platynochaetus rufus* (Macquart).

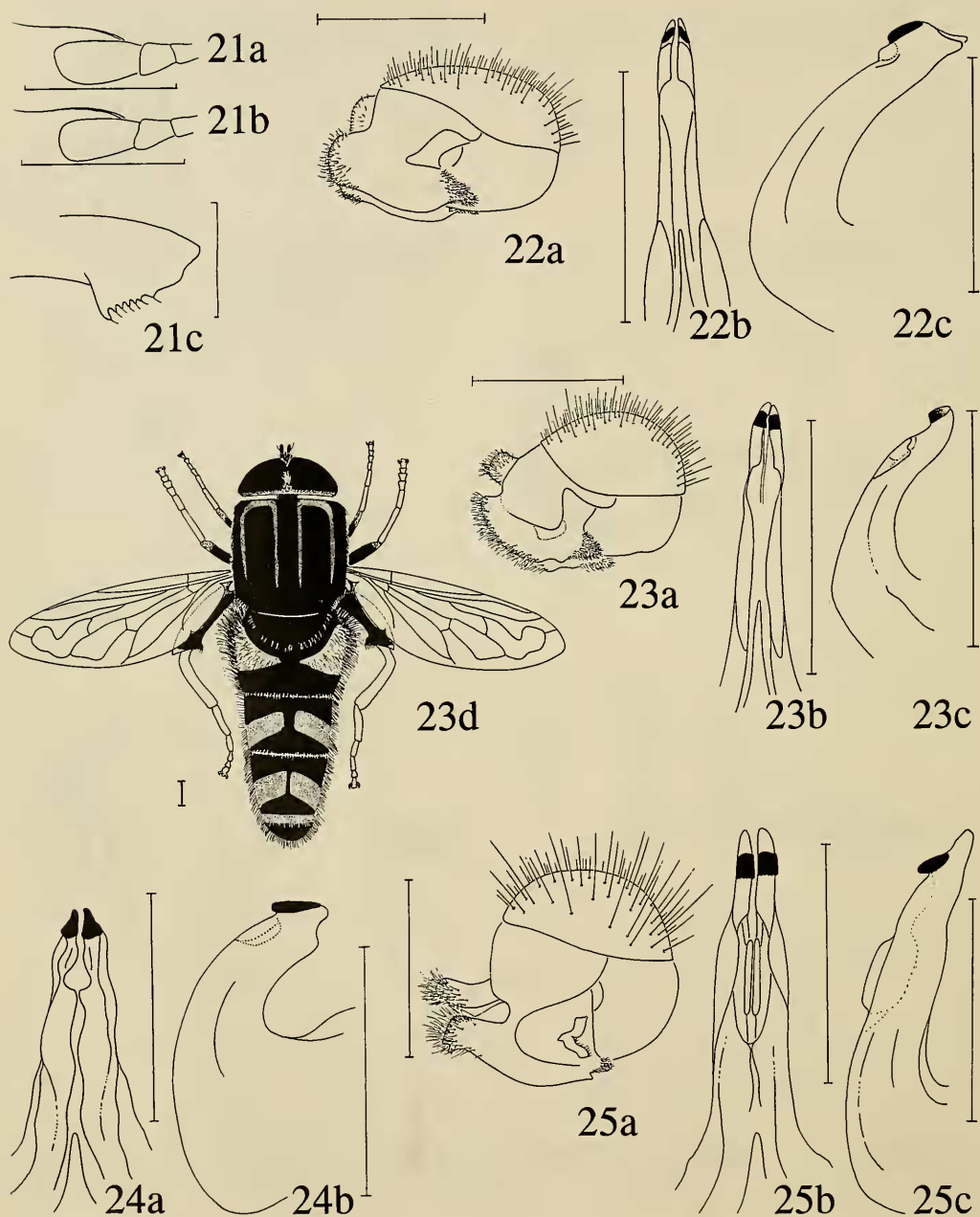


Fig. 21. *Merodon biarcuatus*. a, b, variation in antennal shape; c, distal end of f3. – Fig. 22. *M. clunipes*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus. – Fig. 23. *M. distinctus*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus; d, habitus of ♂. – Fig. 24. *M. femoratus*. a, b, ventral and lateral view of aedeagus; for lateral view of genitalia compare fig. 22a. – Fig. 25. *M. mariae*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus.

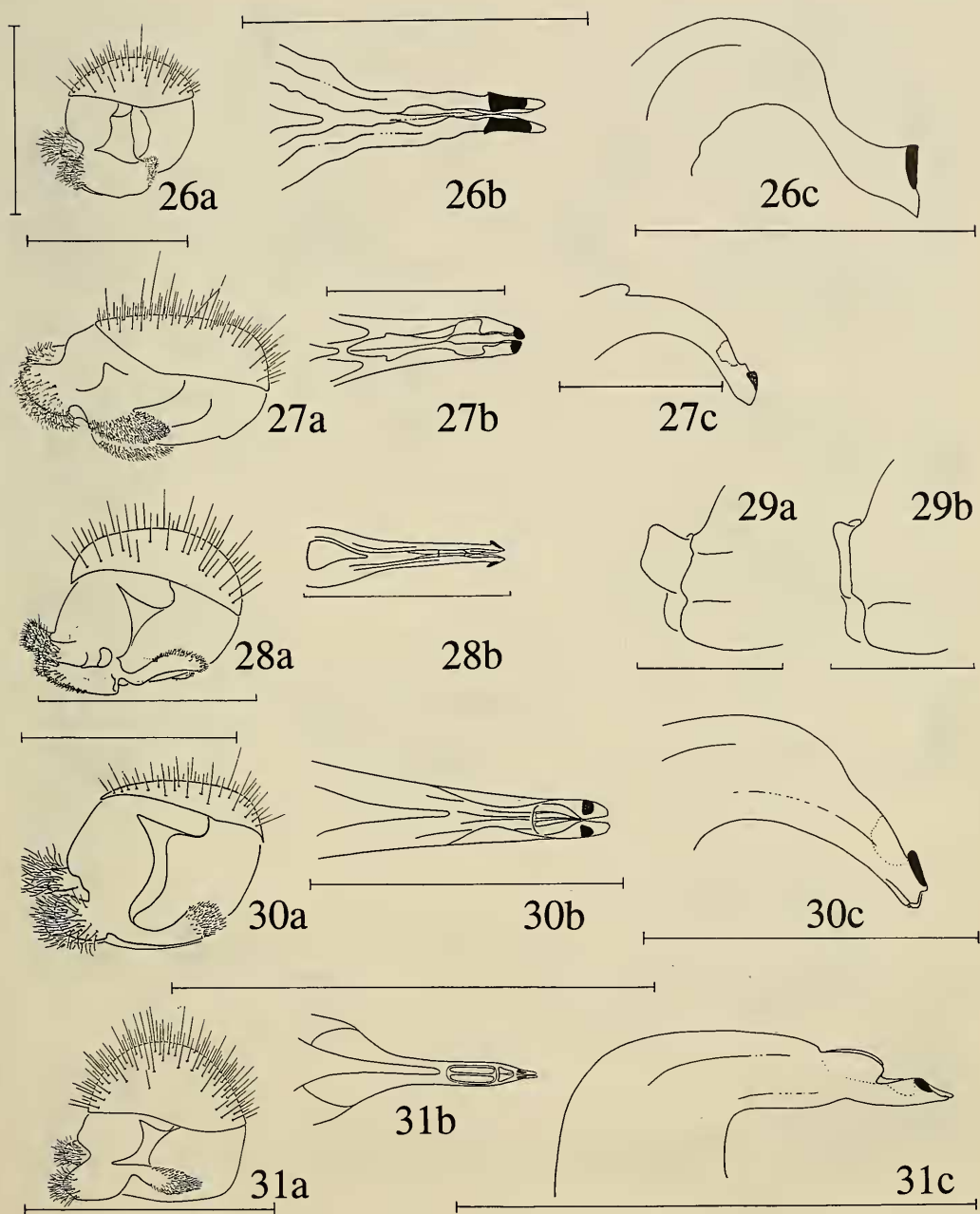


Fig. 26. *Merodon ottomanus*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus. – Fig. 27. *M. testaceoides*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus. – Fig. 28. *M. alexeji*. a, lateral view of ♂ genitalia; b, ventral view of aedeagus. – Fig. 29. Posterior end of surstyle and cercus in *M. alexeji* (a) and *M. altinosus* (b). Pubescence deleted to show difference in outlines. – Fig. 30. *M. hirsutus*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus. – Fig. 31. *M. hypochrysus*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus.

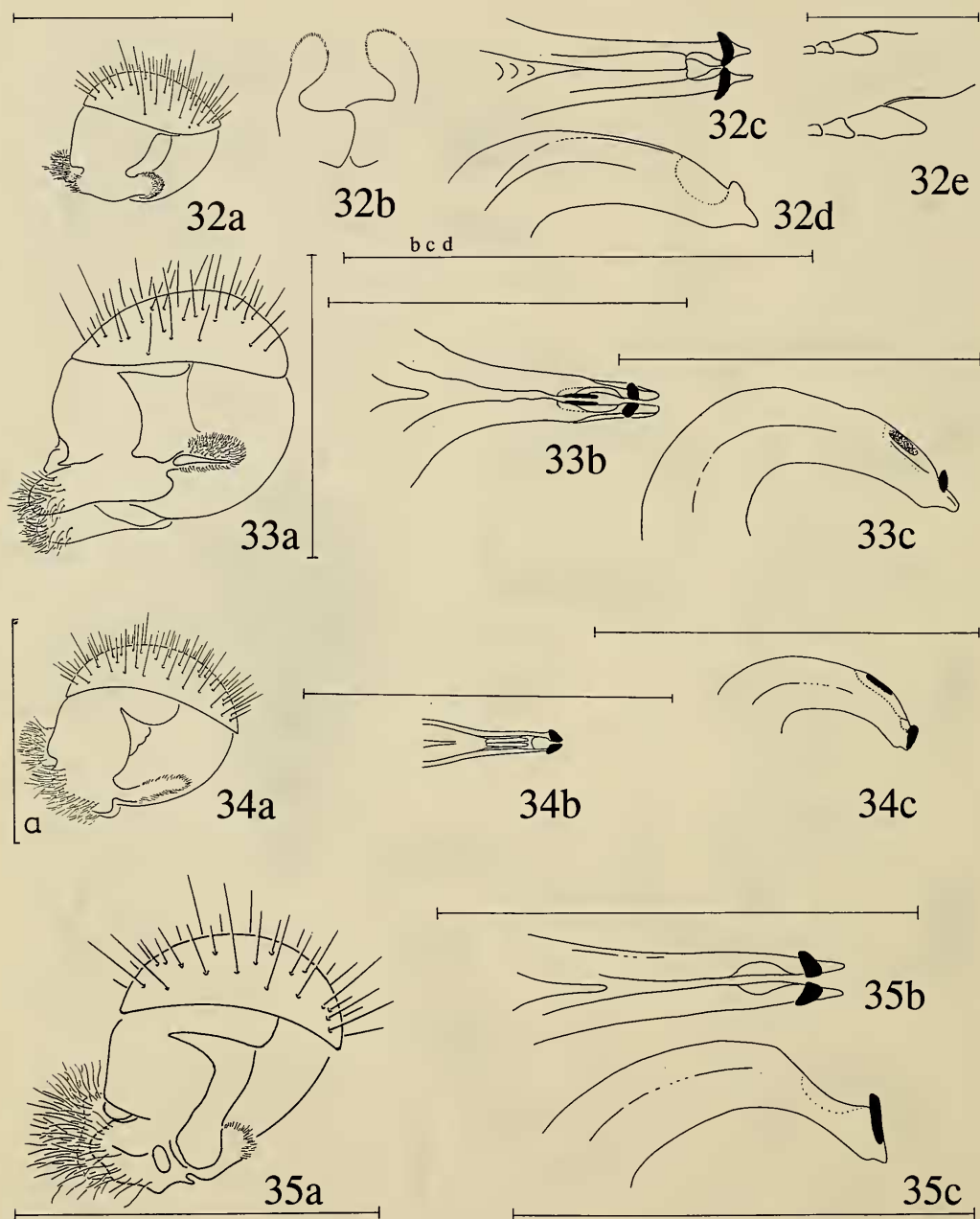


Fig. 32. *Merodon kawamurae*. a, lateral view of ♂ genitalia; b, ventral view of overlapping posterior surstyle lobes; c, d, ventral and lateral view of aedeagus; e, size correlated shape variation in antennae. – Fig. 33. *M. marginicornis*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus. – Fig. 34. *M. rufitarsis*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus. – Fig. 35. *M. sophron*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus; overlap of surstyle lobes as in Fig. 32b.

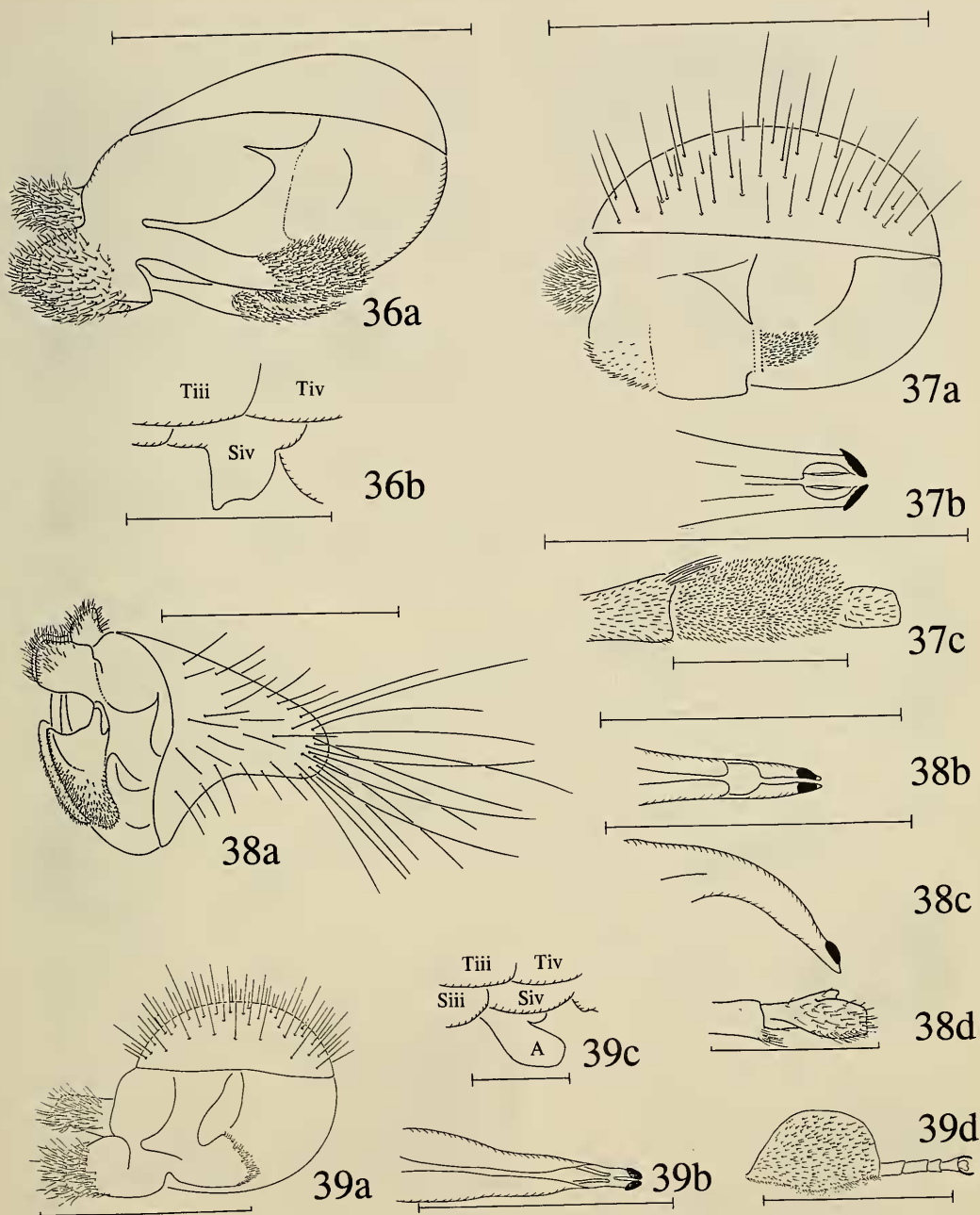


Fig. 36. *Merodon ankylogaster*. a, lateral view of ♂ genitalia; b, lateral view of posterior abdomen: T III, IV = tergites III and IV, S III, IV = sternites III and IV, A = appendage to S IV, G = genitalia. Pubescence on genital cap deleted. — Fig. 37. *M. auronitens*. a, lateral view of ♂ genitalia; b, apex aedeagi; c, anterior view of apical end of tibia 3 and basitarsus 3. — Fig. 38. *M. caudatus*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus; d, posterior view of distal tibiae 3 and metatarsi 3. — Fig. 39. *M. oidipous*. a, lateral view of ♂ genitalia; b, ventral view of aedeagus; c, lateral view of posterior abdomen (lettering as fig. 36b); d, posterior view of metatarsi 3 and other tarsi 3.

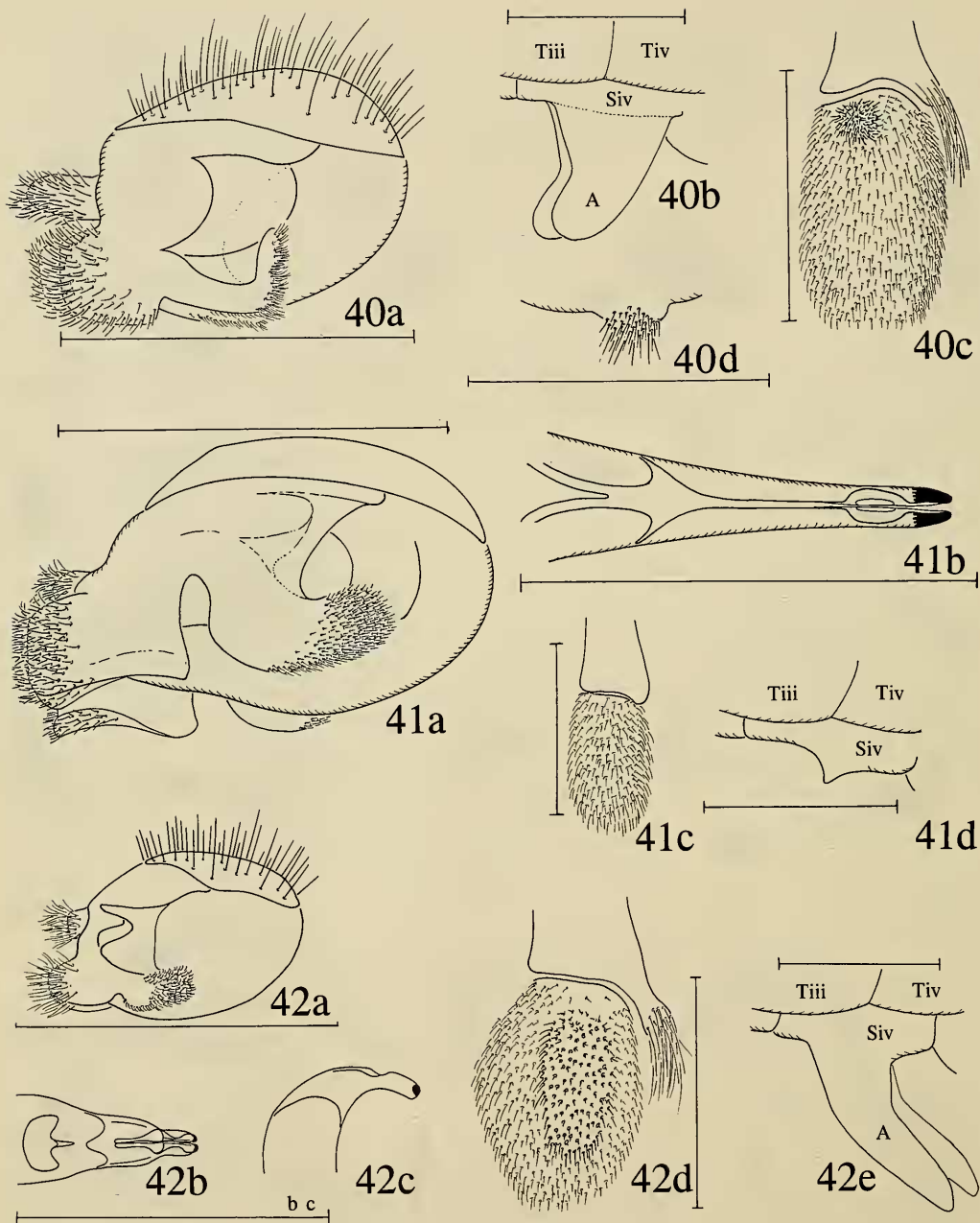


Fig. 40. *Merodon persicus*, a, lateral view of ♂ genitalia; b, lateral view of posterior abdomen; c, posterior view of distal tibiae 3 and metatarsi 3, showing specialized hair-tuft on hump near base of metatarsi 3; d, lateral view of same hump, surrounding pubescence deleted. — Fig. 41. *M. tangerensis*, a, lateral view of ♂ genitalia; b, ventral view of aedeagus; c, see 40c; d, lateral view of posterior abdomen. Pubescence on genital cap deleted. — Fig. 42. *M. tarsatus*, a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus; d, posterior view of distal tibiae 3 and metatarsi 3 showing specialized pubescent area; e, lateral view of posterior abdomen.

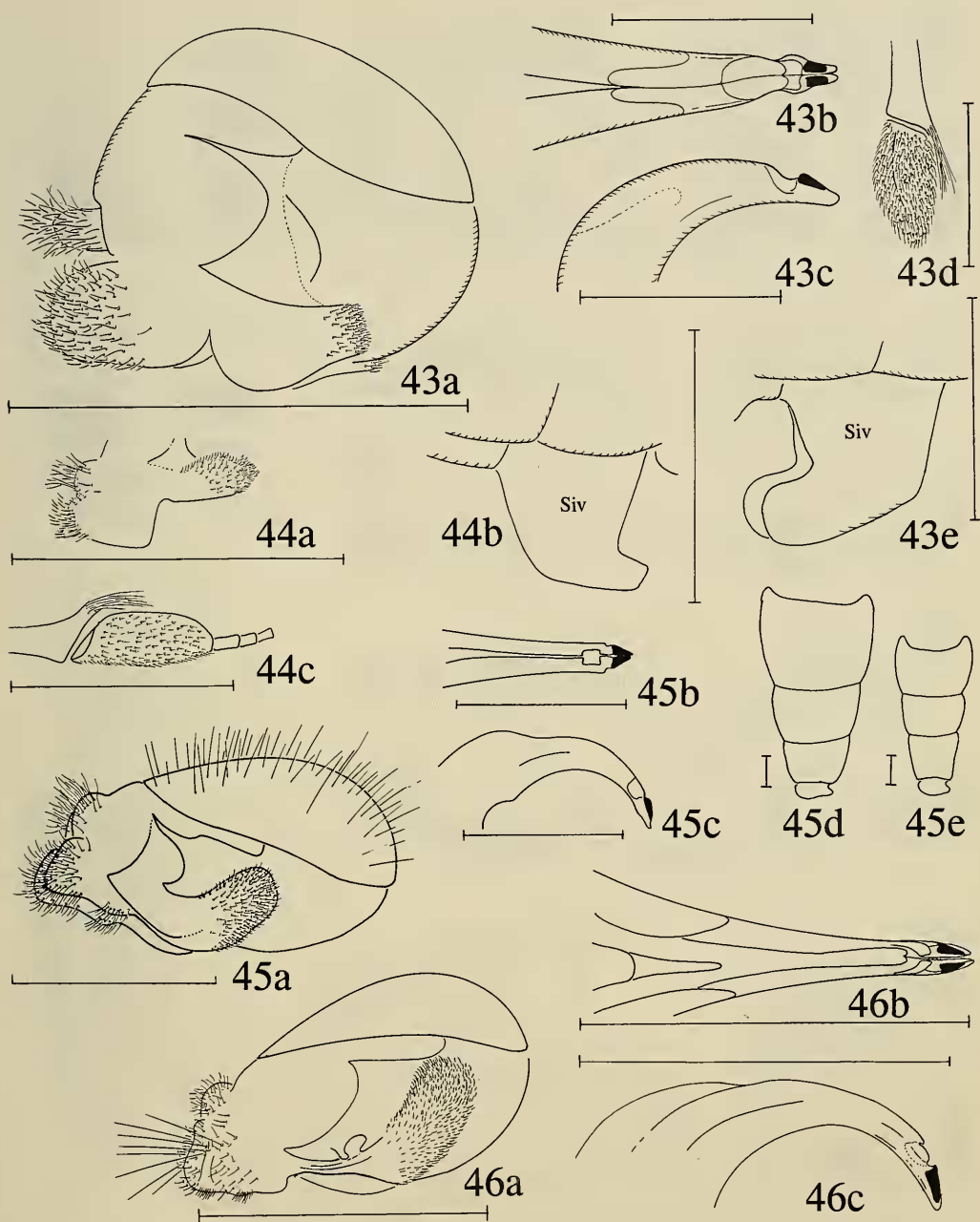


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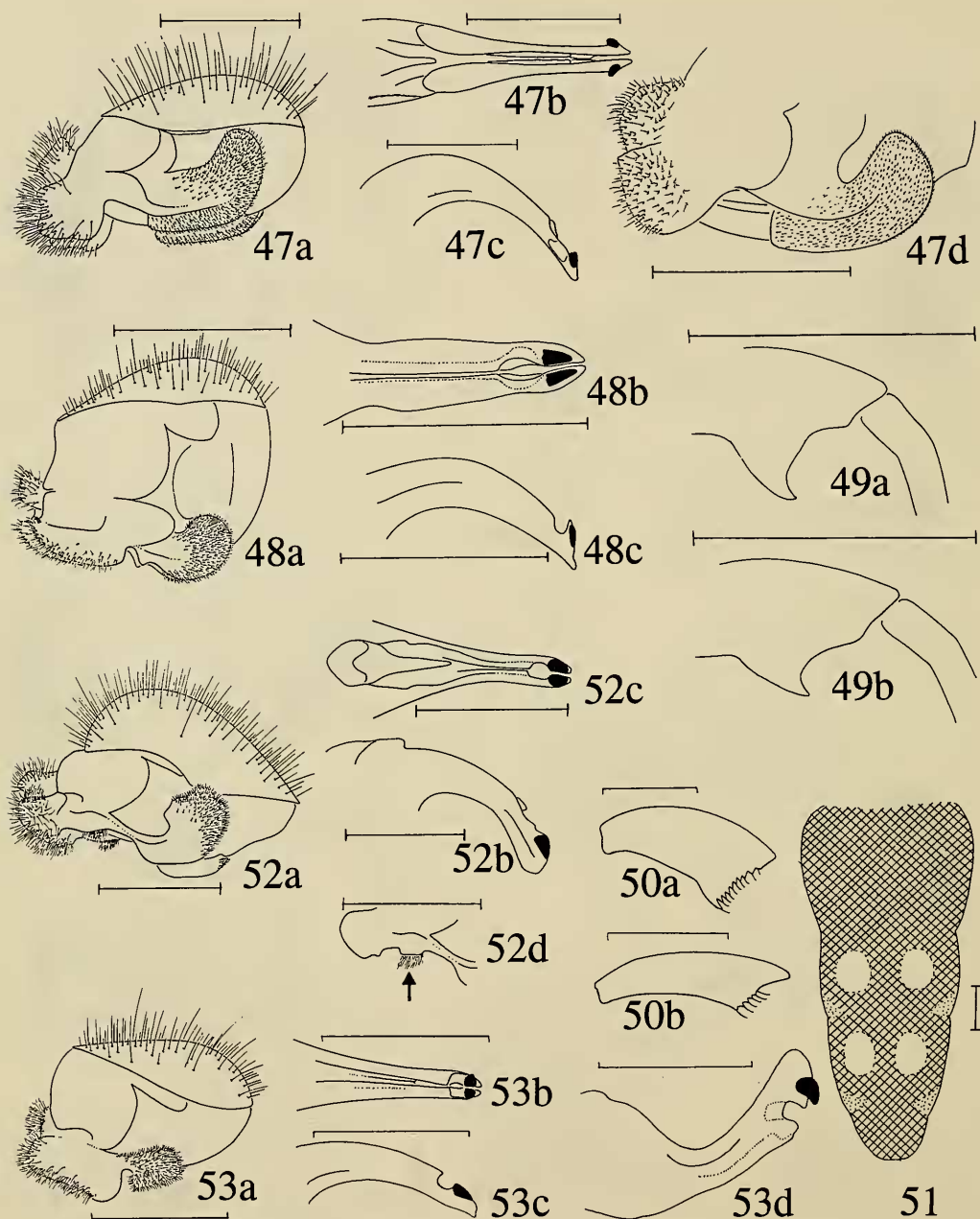


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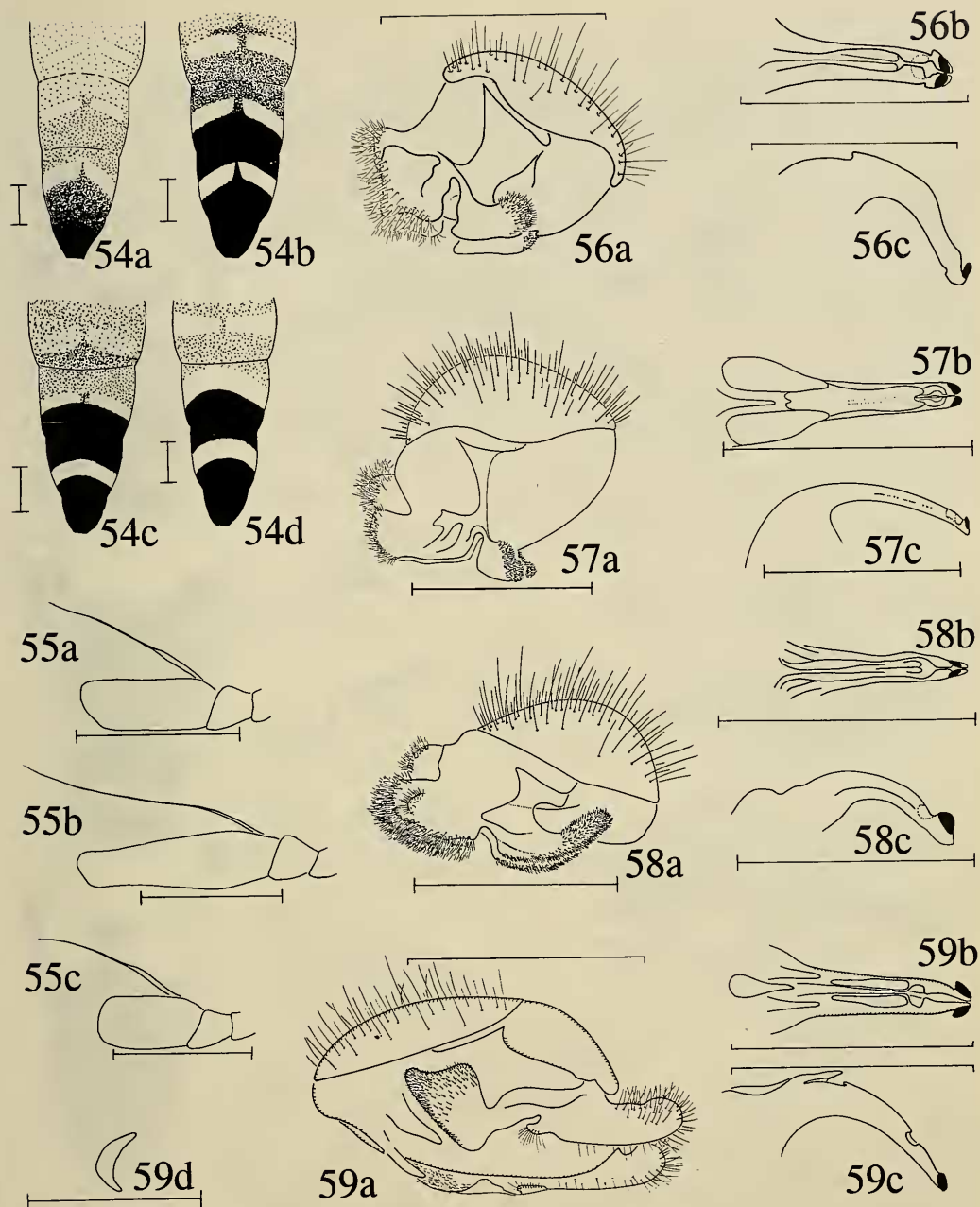


Fig. 54. Colour patterns on abdomina of females: a, b, *Merodon erivanicus* (showing extremes of variation); c, *M. longicornis*; d, *M. kaloceros*. - Fig. 55. Outlines of antennae of females: a, *M. erivanicus*; b, *M. longicornis*; c, *M. kaloceros*. - Fig. 56. *Merodon kaloceros*. a, lateral view of δ genitalia; b, c, ventral and lateral view of aedeagus. - Fig. 57. *M. longicornis*. a, lateral view of δ genitalia; b, c, ventral and lateral view of aedeagus. - Fig. 58. *M. vandergooti*. a, lateral view of δ genitalia; b, c, ventral and lateral view of aedeagus. - Fig. 59. *M. femoratooides*. a, lateral view of δ genitalia; b, c, ventral and lateral view of aedeagus; d, outline of trochanter 3 in lateral view.

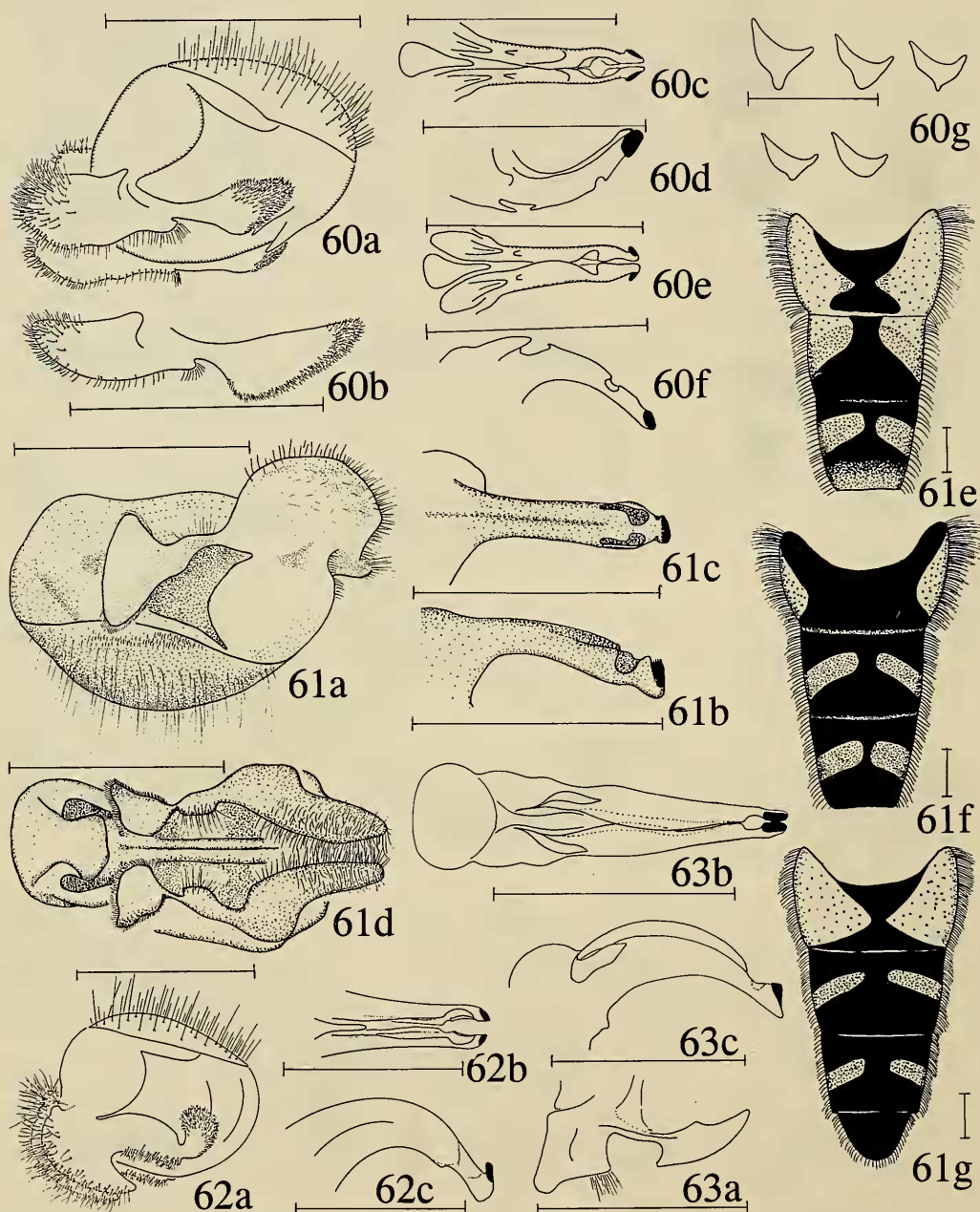


Fig. 60. *Merodon nigratarsis*. a, lateral view of ♂ genitalia (lectotype); b, same from specimen from Handere, Turkey; c, d, ventral and lateral view of aedeagus (lectotype); e, f, same (Handere); g, variation of shape in outlines of trochanter 3. – Fig. 61. *M. avidus*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus; d, ventral view of ♂ genitalia; e, abdominal colour pattern in pale ♂; f, same in dark ♂; g, same in intermediate ♀. – Fig. 62. *M. crassifemoris*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus. – Fig. 63. *M. bequaerti*. a, lateral view of ♂ genitalia; b, c, ventral and lateral view of aedeagus.

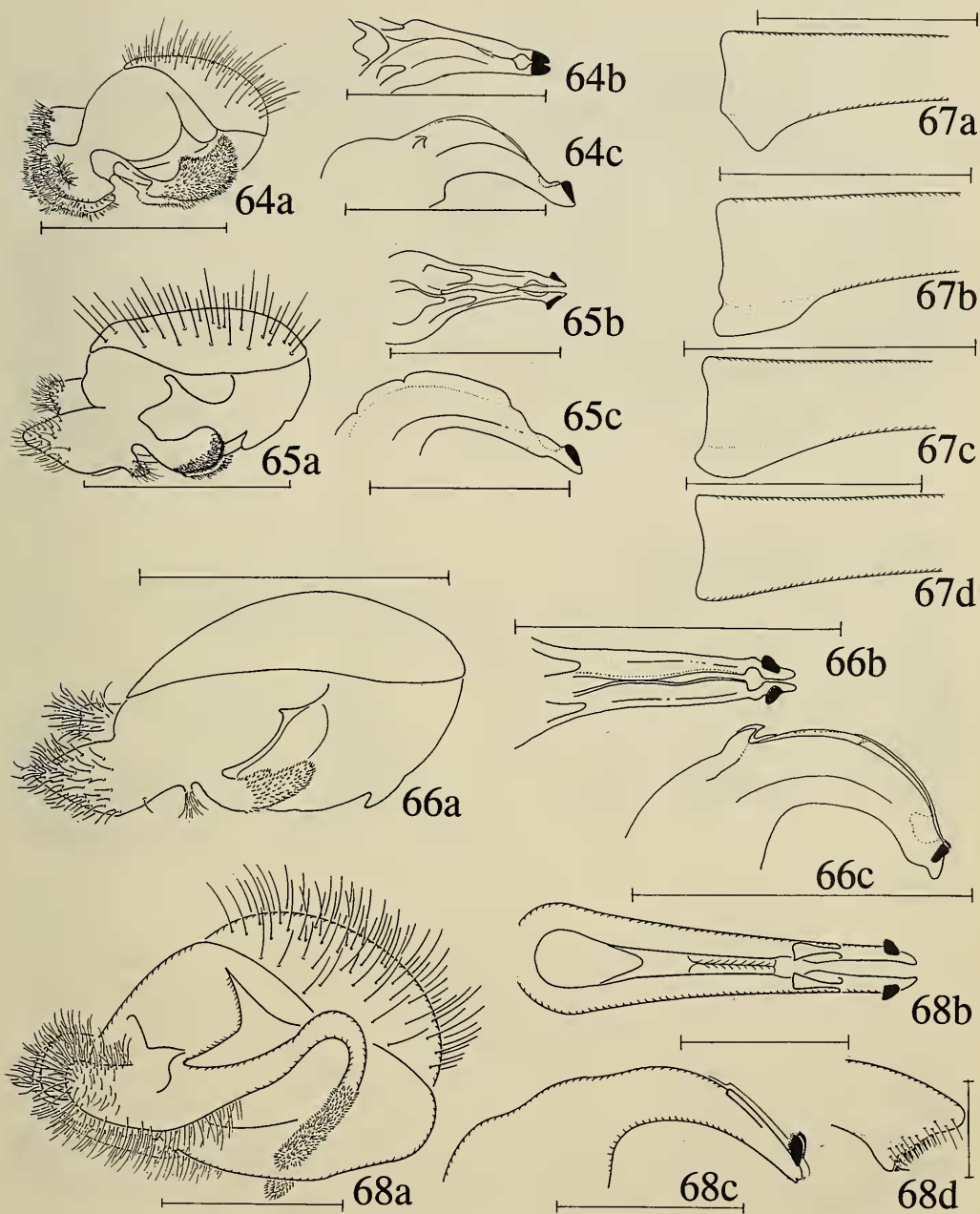


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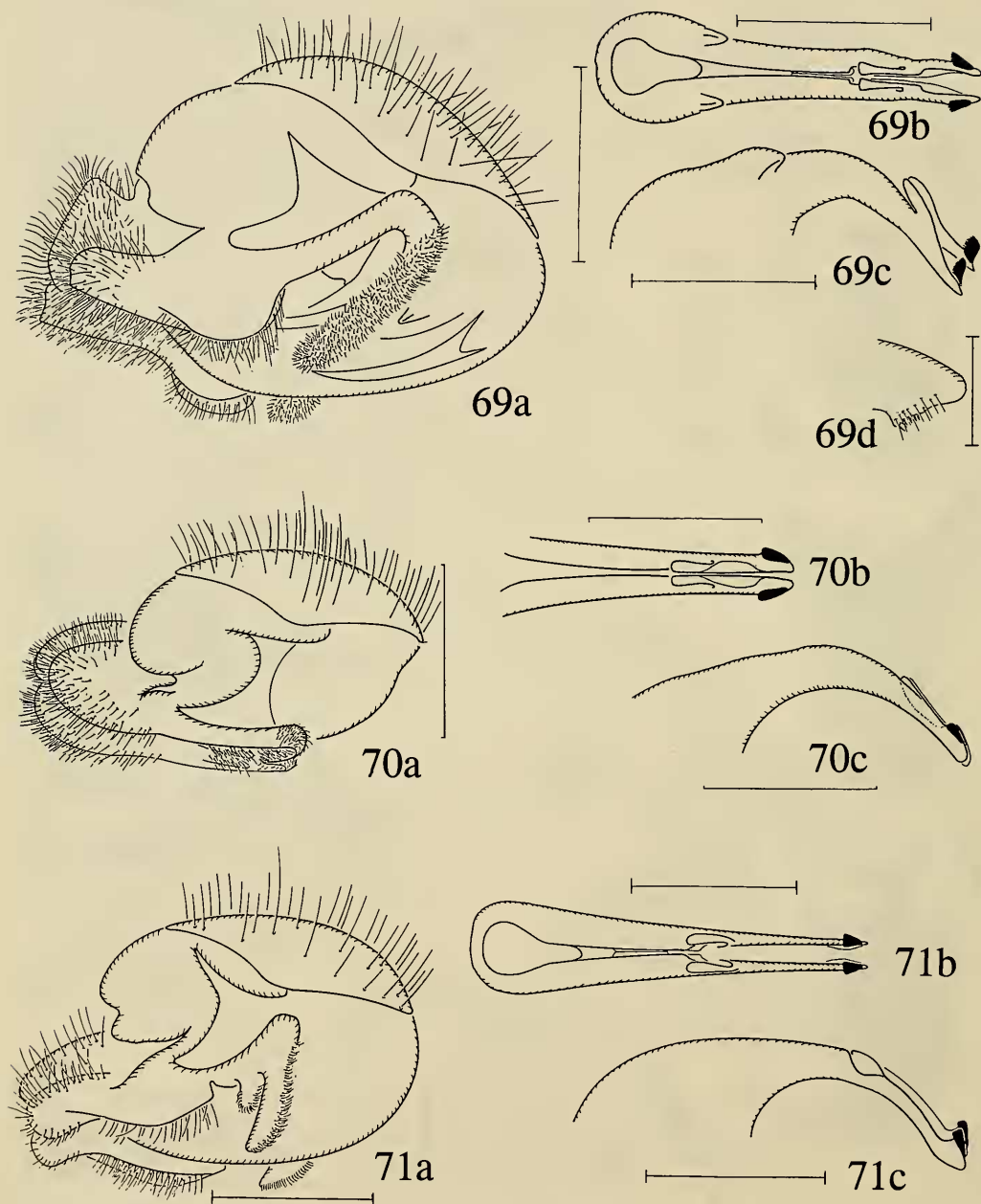


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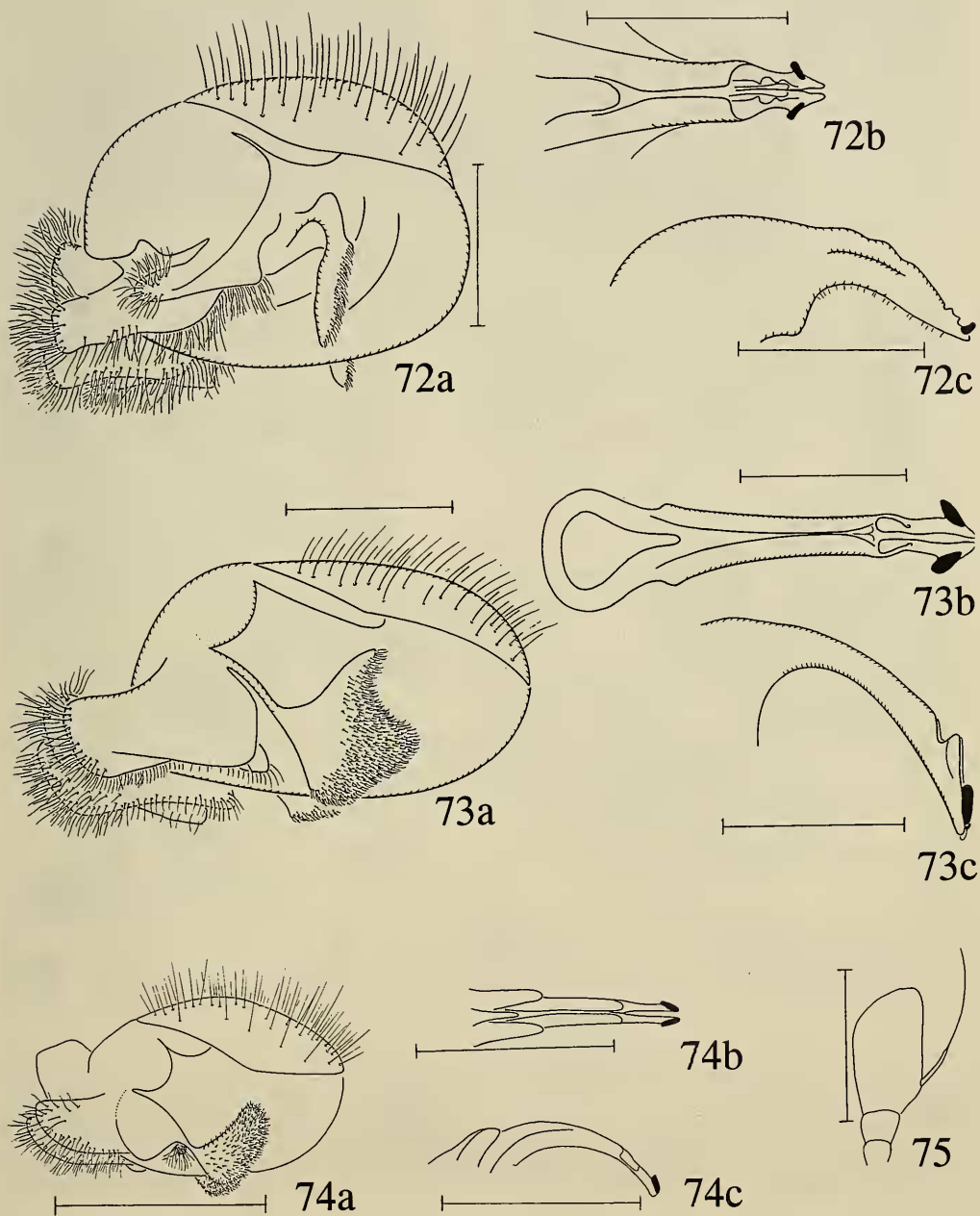


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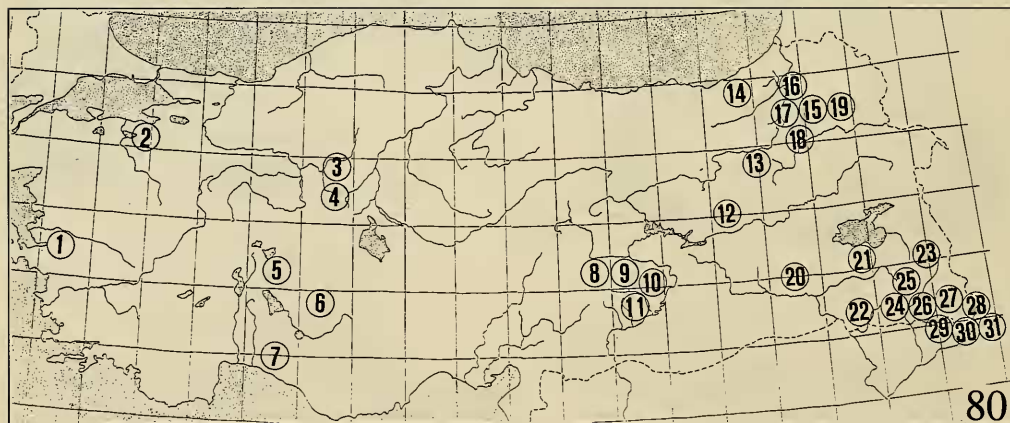
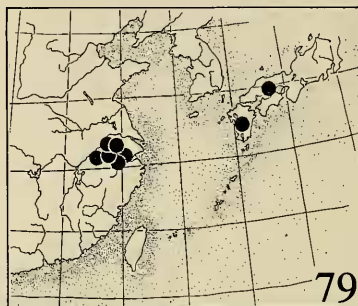
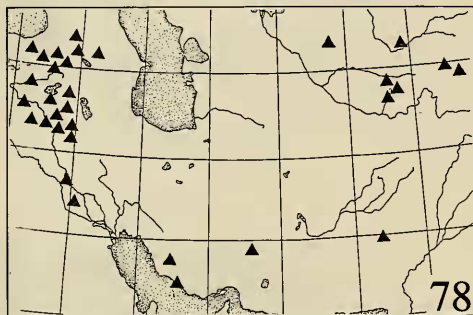
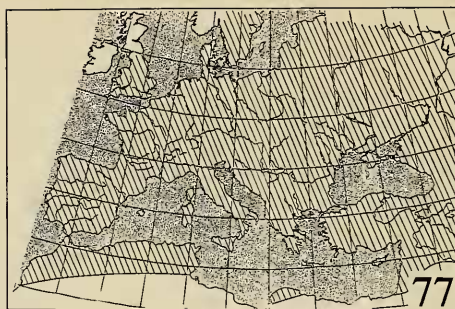
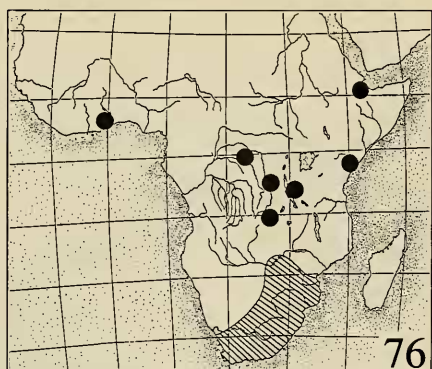


Fig. 76-79. Distribution of *Merodon* in biogeographic regions, hatched area: known conjunct range, dot or triangle: known localities. – 76, Ethiopian region; 77, western Palearctic; 78, south-western Asia. – Fig. 79. Distribution of *Merodon kawamurae*, the only species with a certain natural occurrence in eastern Asia. – Fig. 80. Localities of *Merodon* in Turkey mentioned in this paper: 1, Izmir ['Smyrna']. 2, Bursa ['Brussa']; Karacabey lies slightly to the W, on the coast. 3, Ankara. 4, South of Ankara, near Ankara airport. 5, Akşehir [Ak-chehir]. 6, Konya. 7, Irmesani gedigi N of Akseki. 8, Sarıhacı, 45 km W of Malatya. 9, Malatya [Melatya]. 10, Altı Haral Gölü NE of Celikhan. 11, Nemrut Dağı near Adıyaman. 12, Buglan geçidi (pass) near Bingöl. 13, Palandöken Dağı (Kayak) SW of Erzurum. 14, Ovit pass, near Ispir. 15, near Karaorgan, 8 km W of Sarıkamış. 16, Soganlı railroad stop. 17, Handere, 20 km W of Sarıkamış. 18, 11 km E of Karakurt. 19, Kars Deresi valley 5 km E of Sarıkamış. 20, 20 km W of Uludere. 21, Akdamar, 40 km SW of Van. 22, Suvarihalil pass (on main east-west road through Hakkari province). 23, Mengene Dağı, N of Başkale. 24, Tanin-Tanin pass (on main east-west road through Hakkari province), W side. 25, Habero deresi valley, north of same road. 26, Tanin-Tanin pass near top. 27, Sat Dağları N of Mount Gavaruk. 28, Chilo Dağları. 29, Sat Dağları S of Sat Gölü. 30, Vargös, SW of Yüksekova. 31, Locality S of Yüksekova.



Fig. 81-88. Distribution of *Merodon*. – 81, *M. alexeji* (■), *M. sophron* (●) and *M. tener* (▲); 82, *M. hirsutus* (●), *M. hypochrysus* (▲) and *M. marginicornis* (■); 83, *M. rufitarsis* (■) and *M. tarsatus* (▲); 84, *M. ankylogaster* (■), *M. auronitens* (▼), *M. caudatus* (●) and *M. oidipous* (▲); 85, *M. persicus* (●), *M. quadrinotatus* (▲) and *M. xanthipous* (■); 86, *M. brevis* (●) and *M. turkestanicus* (■); 87, *M. kaloceros* (■) and *M. tangerensis* (▲); 88, *M. cupreus* (●), *M. hamifer* (■), *M. vandergooti* (▼) and *M. warnckeii* (▲).

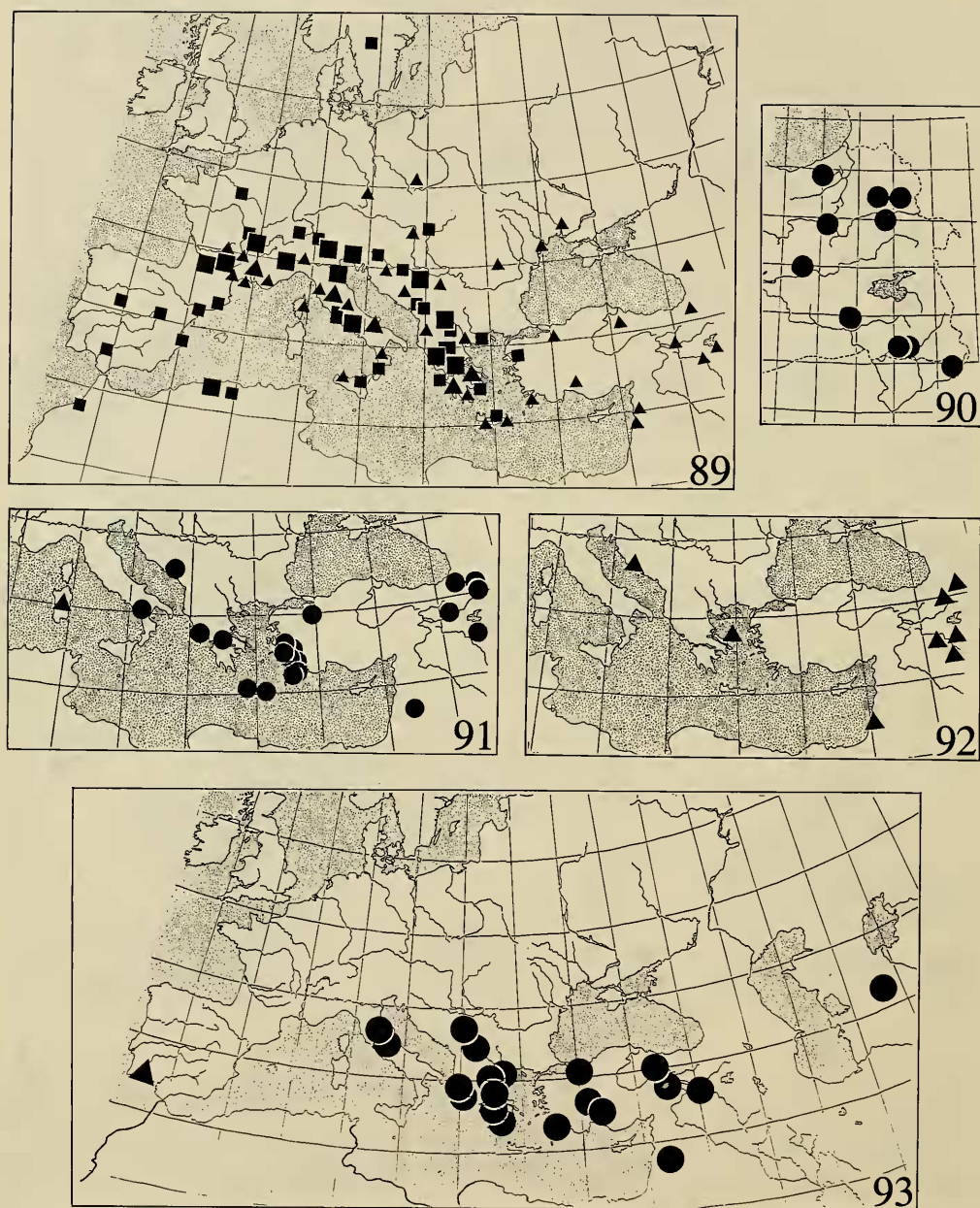


Fig. 89-93. Distribution of *Merodon*. – 89, *M. aberrans* (▲) and *M. clavipes* (■); 90, *M. aberrans isperensis* (●); 91, *M. velox* (●) and *M. splendens* (▲); 92, *M. erivanicus* (▲); 93, *M. longicornis* (●) and *M. lusitanicus* (▲).

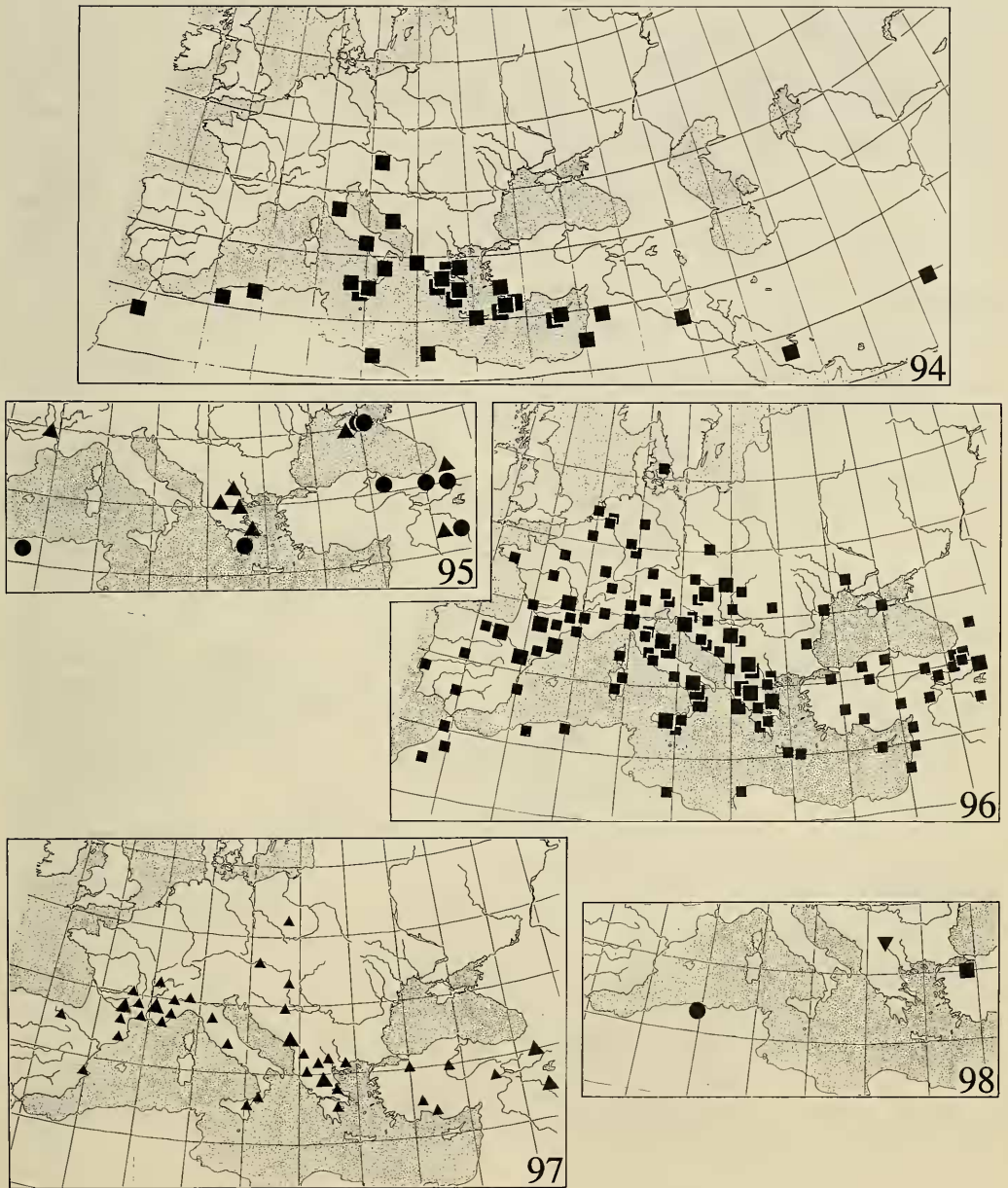


Fig. 94-98. Distribution of *Merodon*. – 94, *M. pruni* (■); 95, *M. crassifemoris* (▲) and *M. femoratooides* (●); 96, *M. avidus* (■); 97, *M. nigritarsis* (▲); 98, *M. bequaerti* (●), *M. manicatus* (▼) and *M. testaceus* (■).



Fig. 99-106. Distribution of *Merodon*. – 99, *M. alagezicus* (●), *M. dzhalitae* (▲), *M. elegans* (■) and *M. toscanus* (▼); 100, *M. schachti* (●) and *M. taniniensis* (▲); 101, *M. nitidifrons* (●) and *M. satdagensis* (▲); 102, *M. altinosus* (▲) and *M. lucasi* (●); 103, *M. biarcuatus* (▲) and *M. distinctus* (●); 104, *M. clunipes* (■) and *M. femoratus* (●); 105, *M. mariae* (●) and *M. testaceoides* (▲); 106, *M. aureotibia* (▲) and *M. ottomanus* (■).

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